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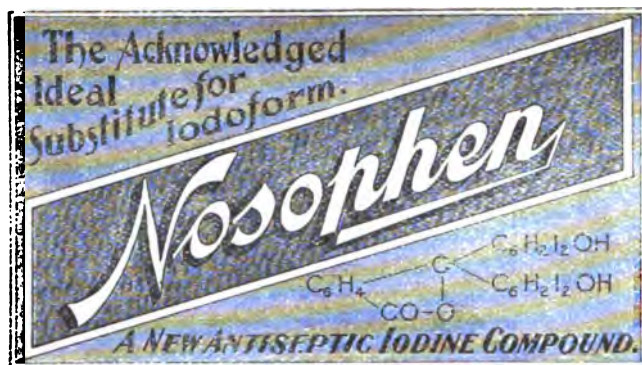
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THE CITIZEN-DOCTOR.*

BY CLARENCE J. BLAKE, M.D.,
Professor of Otology in Harvard Medical School.

There is no country, no assemblage of people, and no form of government in and under which a man can more fully follow the dictates of his own conscience, more adequately pursue an honest purpose and more confidently expect the fruition of worthy hopes, than in these United States of America, and nowhere does citizenship mean more, both in its privileges and its obligations, than under a government of the people, by the people and for the people.

With this solemn thought the man who has maturely come to an appreciation of his opportunities finds himself inevitably face to face with the question, what can I do to serve? and since each man's duty as a citizen lies foremost in the walk of life which he has chosen, or which has come to him, I have taken the Citizen-Doctor as the subject of our talk to-day.

"First, man; second, citizen; and then doctor, is the right order," says Edward Emerson, but, with the broadening of our medical education, with the increasing demand for that ounce of prevention which is worth a pound of cure, a demand born of the increase in popular intelligence, the man who is a doctor finds the bounds within which he may express his citizenship enlarging, and that there is before him an ever widening place in the life and interests of the community; a place which it behooves him to be, first, a true man, second, a worthy doctor and wholly an earnest and grateful citizen to adequately fill.

It is safe to say that no man enters upon, or continues in, the study of medicine from selfish and mercenary motives

* Address delivered at Yale University, June 28, 1898.

alone; indeed such motives are entirely incompatible with persistence in the study, or success in the practice of, this profession.

As an incentive to the study of medicine there is more required than the thirst for knowledge or the zeal for scientific investigation.

The purpose of a life which leads a man to battle with his instinctive dreads, to fight his normal repugnance, and to prosecute one of the hardest courses of education, lies far deeper than any merely intellectual gratification, since it finds its roots in the thought of that benefit to humanity which makes the crowning impulse to a useful life.

Nor should it be forgotten that the study of our human kind, so necessary as a foundation for the actual practice of medicine, contains within it a personal appeal to all that we like to know and regard as highest in ourselves; and that this, as an additional incentive, looking always to broader and broader possibilities, is one of the lights which throws all that might be otherwise instinctively deterring and abhorrent in the study of medicine, into the deeper shadow in which it is forgotten.

There is probably no one of this graduating class who does not recall, as the two primal incentives which led him, as a schoolboy, or as an undergraduate, to decide upon this as his life career; first, a desire to know more of the life we live, second, the appreciation that life itself implies a debt which must be paid in usefulness in living—a desire for knowledge, the possession of which is honor—a desire for the means of using that knowledge beneficially, which is service, honor in the one line, and service, the rendering of self to the needs of other selves, in the other; honor and service the two parallel lines, between which move quietly and steadfastly, if they are lived at their best, the purposes of the medical profession.

The course which you have thus far pursued under wise and able teachers, while it has afforded you the means with which you are soon to begin, and has laid the foundation for, that further acquisition of knowledge with which you are to continue your life work, has failed of its fullest purpose unless you have individually learned the lesson of its nobility, and that you enter upon this career less for what you can get out of it for yourselves than for what you can put into it for others.

The very beginning of our medical studies is an acquaintance with the structure of the body, that beautiful dwelling of which we are tenants at the will of its Creator, a study which awakens at first wonder and admiration, and then, almost

unconsciously, reverence, and leads inevitably to that appreciation of the moral value and moral use of the human body, which remains, and not only remains but grows in the life of every true physician; so that through wonder, admiration and reverence, he comes to an understanding of the privileges of his knowledge, and to the consciousness of the debt which he owes for it, and which it is his further privilege to pay in service to his fellow men.

If the study of anatomy calls forth our admiration and reverence, the study of physiology takes us a step further forward in the knowledge of the wonderful adaptation of means to ends, of the manner in which the different organs of the body do their work and supplement each other, and of that beautiful provision for their maintenance and repair which bears added evidence of a definite plan in design.

The study of the body in disease still further convinces us of the power which underlies these processes of repair, and of the fact that the dominating principle in the creation of the human machine looks to its persistence to useful ends. The part which becomes dead through disuse or abuse becomes a slough, is separated, thrown off, and replaced by newer tissues. The body which is not duly exercised, the mind which is not continually trained, soon lose their power, and their effective day is done; the moral purpose which is not kept taut in the straight line of its greatest effectiveness and greatest activity, comes to be a devious entanglement which bars the way to further progress.

The training as undergraduates in medicine teaches us that lesson of activity, which is a necessity to success in the acquisition of further information, and, in its practical application, the value of that wholesomeness in ourselves which is absolutely necessary, since it must represent the standard for measurement, to a just estimate of unwholesome conditions in others; it teaches us the importance of self abnegation, because in all research called scientific, since science is the search after truth, the personal equation is always the questionable, and often the disturbing factor.

Many years ago in experimenting on molecular movement in solids my father subjected a slab of feldspar to a continued heat of 2400° F. for many days. When put into the crucible, the feldspar was opaque and grayish in color, because of the admixture of minute particles of metallic iron. At the end of the appointed heating time the furnace was allowed to cool, and the feldspar was found to be clear, glistening and transparent,

with the metallic iron in a compact vein upon one of its smaller surfaces. The lesson is not far to seek.

There is probably no line of study, other than the one you have chosen and pursued, which makes such absolute demand upon a man for the rendition of himself. The eyes which look into those of the physician, be the patient man, woman or little child, challenge him always with the question, what manner of man is this who has come to me in my need?

The sick person is always, in some measure, helpless and in need of help; to him the physician must be able to bring, first of all, the truth, that which he knows, or else the statement that he does not know; and, as he goes on in his practice he will find himself able more clearly to define his knowledge, and more willing to confess his ignorance; it is only the little man whose horizon stretches no further than the tips of his own fingers who is afraid to make this admission.

And furthermore, the man in whom the weak trust, to whom the sinking look for help, and the sorrowful for such mede of consolation as the truth can bring, must, in the continued fire of an earnest and reverent purpose, burn out of himself and set aside the dross and learn to keep himself clear for the passage of that light which it is his great privilege to transmit.

For in no work in life is the relation with the individual and the community so close; to no one is given so fully as to the physician the opportunity to study human motives and human needs, to guide the one, and to minister to the other; *cognosce occasionem* might well be one of the mottoes of the medical profession, and to know his opportunities, to minister to the body, and to the life within it, the physician needs to look first of all well to himself, to be sure not only of his knowledge, but of the purpose to which he is to use it, and of *that* his conviction must be honest, steadfast and sincere.

In the old days of coming of age the young Lord of the Manor was presented to his people amidst joyous festivities, a part of which included an enumeration of his various newly acquired titles, holdings and estates. Upon this threshold of your home, *you* stand to-day and look forth upon that of which you have come into possession. It is a noble heritage. No line of human work has been more directly inspired, none has found its votaries more eager, more willing to sacrifice themselves, counting their individual life of little value, so that it helped others to live more abundantly; recking very little of credit, so that the work were done well.

How this is being done is shown by the steady advance in our knowledge of the nature and of the remedy for disease, and still more important, our knowledge of that branch of our profession to which we give the name Preventive Medicine, and which finds its foundation in the knowledge of healthy living; an advance, it may seem startling, but is nevertheless safe to say, which is paralleled within a given period of later years, by no other line of scientific investigation.

In 1876, those of us who saw the International Exhibition in Philadelphia, said, to ourselves, the discoveries in science and in the adaptation of scientific knowledge to human uses has been such during the last twenty-five years, as illustrated here, as to make it impossible, apparently, that the next quarter century should show a similar advance; and at that very time there was, in an out of the way part of the electrical exhibit, a little instrument, which came very near being passed over as a toy, but which held in it the germ out of which should grow enormous activities in a new field of investigation. In 1878, in an address before the British Society of Telegraph Engineers in London, I ventured the prediction that the gain to science during the next twenty-five years from the invention of the so-called toy, the telephone, would far outweigh in value the commercial advantages to be derived from the use of that instrument; and now, notwithstanding all time saving, all the contributions to our comfort and convenience, and with the long distance telephone service bringing more than 32,000,000 of people on this continent within speaking distance of each other, I believe the prophecy to have been fulfilled.

Go back with me for a moment, over a period of a little more than thirty years in medicine, and make your own contrasts between the then and the now. The eye with which we see the infinitely little was just coming into practical use in medicine, and I very well remember the pride of Dr. Holmes in his first microscope, which he had arranged upon a wooden base with a handle to it, so that it could easily be put into, and taken out of its box, without touching the instrument, an ingenious arrangement which gave some of the colleagues of the Professor of Anatomy an opportunity to deride it as Dr. Holmes' flatiron, with which he proposed to smooth the way in the more intimate study of his beloved subject.

At that time also the opportunities accorded the student for the practice of midwifery and the study of diseases of women were so meagre in most schools in this country that it was necessary to seek the clinics of London, Edinburgh, Paris and

Vienna to secure an adequate equipment in this important branch.

The surgery, too, was very much the surgery of old; pus dressings were not uncommon, healing by first intention was something to be unusually grateful for, and suppurative wounds the rule; dropsy was frequently enumerated as a disease, and the surgical invasion of the abdominal and cranial cavities was, except under certain limited conditions, regarded as inadvisable, if not unjustifiable.

The one definite specialty in medical practice was ophthalmology; comparatively little was known of diseases of the ear, and autopsies showed many cases of abscess of the brain, with which the suppurative disease of the ear was supposed to be merely coincident, or was not regarded at all. Our hospitals were equipped according to the fashion of a day in which asepsis was unknown, and in the operating room the knives were taken from a plush-lined case when required, and often the surgeon tested the edge of a catlin on his thumb. The nursing of the patients was entrusted to men and women who were supposed to have a natural aptitude for this service; they were expected to learn from their own observation, and I have vivid recollections of the experiences as a house officer in the first year of the Boston City Hospital in 1864, when such conditions as those to which I have alluded pertained. The patients got well, most of them; the progress toward health in the surgical, as well as in the medical wards, being often slow and tedious; and the five house officers who had that year of duty came out of it with an abounding admiration for the *vis medicatrix naturæ*, as the three of them who are still living persistently attest.

It would be very difficult for you, unless you could complete this mental picture, to appreciate what this thirty years of heritage has given you. The elaborate preparation which has been accorded you, puts you at graduation on a par with, and in some respects, in advance of, the best living practitioner of to-day in all but one thing, his practical experience, that superimposed series of observations of individual cases which gives him a composite as his standard for comparison and enables him to draw with speed conclusions which you can at present accomplish only at leisure.

In passing from the medical department of Yale University, you are only entering another school, one in which the studies do not slacken, in which the effort must be in no whit diminished, and in which the examinations come every day in the

year. They are examinations which you yourselves must proctor and adjudge, and which make, therefore, upon you the demand for that character, the sustaining of which is an absolute necessity to your progress in your profession.

The school which you enter is that of the applied art, and there are certain rules which you can with advantage adopt in this your new curriculum. One is, to so regulate your thought-life as to keep yourselves steady to the end you have in view, that best end of usefulness. You cannot help others to find the truth unless you seek it within yourselves. You cannot transmit that light which falls upon you, because of your education, in such abundance, if you let any film of self-consideration obstruct its rays. To this end also you must be firm and rigorous with yourselves, though your knowledge of those physical causes which sometimes underlie moral delinquencies may make you lenient to others.

You must work strenuously and incessantly. The very catalogue alone of what has been accomplished in medicine in the last thirty years, shows you upon what sort of a race you have entered.

You cannot prosper unless you transmit. You must give as well as receive, in order to keep your own mental currents healthy.

You have no right to this heritage of the past unless you contribute something to it for the future, and while the physician's absolute first duty is to his individual patient, he must be a student who teaches as well as a practitioner.

"Then is it not also true," said Plato, "that no physician considers or enjoins what is for the physician's interest, but that all seek the good of their patients, for we have agreed that a physician, so called, is a ruler of bodies and not a maker of money," or, as Dr. Holmes has pithily put it in one of the watchwords which he has given to the profession, "the principal object of the practice of medicine is the benefit of the patient." Truly this, and to fulfil it we must in no way stagnate ourselves, we must keep pace with the advances of our times, and must add our contributions to the mass of information as well as our stimulus, through example, to other workers.

The man who, when he graduates, says, "I have worked hard for four years or more, now I will settle down and wait for practice," waits.

The waiting is apt to be the creation of that abhorrent thing, a vacuum. Do not wait—work. Above all things, if you can, get into, or into connection with, a hospital.

When asked what desirable thing the Faculty of the Harvard Medical School could accord the students, one of them replied, "What we want more than anything else is to touch a patient."

How much of thought lies behind that earnestly expressed desire. How much we need to stand face to face with our medical problems, and how little, comparatively, the books and the lectures alone can teach us, is shown by the change which has come over medical instruction in the last few years. The didactic instruction has steadily diminished, and the laboratory and clinical instruction have steadily grown.

In the older time, when the medical school instruction consisted of two or more courses of lectures, extending over a few months in the year, it was understood that the remainder of the time should be spent in the office of, or riding about with, an active general practitioner. The clinical instruction was thus provided.

With the growth of scientific investigation, the incoming of laboratory instruction, and the consequent enlargement of the medical school work, this form of clinical teaching fell into the background, and it became necessary to substitute the material of the hospital, and, while this is an efficient and more abundant substitute, it still leaves to be desired that experience with the individual patient in his own surroundings, which can be acquired only in active practice.

The hospital, as at present constituted, with its well organized medical staff and its trained nurses, affords not only an admirable field for the consecutive study of disease, but it inculcates habits of order, of precision, of accuracy in observation and of record, which are exceedingly important to the young man going out to make his own place in the community, and I would suggest, therefore, to each one of you, as a part of your graduate schooling, some share in hospital or district work, the advantage of the latter especially being that you come to a knowledge of ways of living in the midst of the material realities of life, which will tend to enlarge your horizon, as well as your understanding, as no other experience can.

Remember also that it is our part to meet moral as well as material problems. The graduate of the Divinity School goes out to his life duty, wearing a cloth which marks him as one set apart to the good work of the world. His garment is to him a protection, since he stands thus avowed; he is one of a regular caste, but this very robe is sometimes a barrier between him and the people he would reach.

The doctor bears no such mark, his vow is a Hippocratic oath; his brotherhood with his fellows, none the less real, is not so evident. His protection lies in his unproclaimed fight for his own integrity, and as an individual among men, he often gets nearer to the inner man of his neighbor than does the clergyman.

It behooves him, therefore, so far as in him lies, to find the truth and speak it. His intimate knowledge of human weakness and human motive, as well as of the basal rules of health, his knowledge of the thus far and no further as set forth in Nature's laws, in the light of his daily experience, make it incumbent upon him to live himself as an example, in order that he may speak and not be ashamed; and in order that this influence of his profession should be conserved and made to grow, he must live for that standard, die for it if need be, in order that his brethren, too, may be held worthy of their ministry.

English is a beautifully fine and honest mother tongue, too honest, with its short, crisp, forcible syllables, to be lightly used, and the doctor who has to study the inherited and acquired weaknesses of mankind, to search their follies to the dregs, who knows too much to despise, and who must learn, therefore, both to pity and to teach, has need to speak firmly and plainly; but to earn the right to this, he must first himself be strong.

Take, therefore, as greeting for your future, this four-square rule in your life of service—1, clean living; 2, just thinking; 3, hard work; and lastly, carefully weighed, straightly dealt, when there is need of it, as need must sometimes be, both within the profession and without it—English from the shoulder.

The festivities of the coming of age are over, and the young Lord of the Manor, entering upon his possessions, if he be wise and not wasteful, if he regard his life for what he can put into it, and not for what he can get out of it, turns himself to the question of the responsibilities of his inheritance.

You have each one of you to decide upon the course you are to pursue, guided thereto by natural aptitudes and inclinations, or by fixed and determined purpose. One man goes back into the country to help an older practitioner, whose still undimmed enthusiasm is weighted down by age; another proposes settling in general practice in the city; still another has it in mind to study the diseases of some special organ, and to devote himself to the limited field of practice which therewith accords; still another, whose substitute for the wholesome necessities of bread winning is an ardent studiousness, will devote himself

to laboratory research, and through his investigations make the practical work of his colleagues easier and more fruitful. To each one of you there is given, out of a life experience in the medical profession, this advice; make that which you have chosen your first consideration, your sole line of expenditure of effort, except in so far as you bring other things to bear upon and to contribute to it. Be the doctor first and foremost or be the doctor not at all.

You will have many temptations into other paths of usefulness; the luxury of intellectual exercise in other lines will tempt you, but aside from such occupation as is necessary for relaxation, put aside diverting things. Privilege and responsibility go together.

It is so great a privilege to be a doctor, that the man who holds that title truly, owes every thing that he can give to it, and he may be called upon to give much.

To the man who is to settle in the country, let me say, first, if you can, get a hospital appointment, if you have not already had one, and learn at first hand not only the meeting of those emergencies with which you must single-handed deal, but that other lesson, the study of the patient as well as of the disease, and when you go to your country practice, keep in touch with your profession through your local or state societies, and read as broadly as you can.

To the man who is to settle in the city, likewise, get, if possible, a hospital appointment, attend the medical meetings, in which you will often get much more from the discussion than from the papers read, learn to measure thereby your own habit of thought with that of your professional brethren; do not wait, but work; depend, so far as you can, in justice to your patient, upon your own skill and judgment, as you would be obliged to do if you were a practitioner in a more sparsely settled district, rather than yield to the easy temptation of placing the responsibility upon your neighbor next door.

To the specialist, I would say, remember always that, as a rule, the man who succeeds best as a specialist, is the man who would have succeeded as a general practitioner. You have had the privilege of special opportunities for study; you must show yourself worthy of them, not only by applying them, but by taking every opportunity which comes to you of distributing your added knowledge among the members of the general profession.

To the man in the laboratory, I would say, do not let your devotion to your particular subject lead you to forget that you

are a member of that broad profession which brings all its power to center upon one object—the individual man, and upon one purpose—his betterment.

And to all I would say, as you go on in your study and practice, one sense will grow upon you, or you yourselves will cease to grow, and that is, a sense of your obligation, and with it will grow the question as to how this obligation can be discharged.

Your further contact with, and intimate study of the individual, leads you to a better appreciation of the needs of the mass, and you will find yourselves facing certain of the problems of social and community life, with an earnest desire to take a hand in the furtherance of their reform or enlargement, which will not be satisfied until, so far as in you lies, you have paid this debt.

With your devotion to your profession, the questions concerning its intellectual and moral advancement are those which first occur to you. Having had the best attainable education of your time, it is your just desire to see that the man who comes after you gets a better.

The advances which are being made in medical instruction in this country are entirely in accord with this wish.

Within a very few years the course of study in many of our medical schools has been increased to four years, simply as a matter of necessity, because the shorter time has been found insufficient to include all the studies which the present and growing standard of the profession demands.

In all educational institutions fostering the growth of the tree of knowledge, the spreading and uplifting of its branches, demand more nutriment at its roots, and medical schools are already beginning to require a college degree as one condition of admission within their walls.

The formation of alumni associations gives you the opportunity of keeping in touch with the advancement of your own particular school, in order that you may promote its interests by the influence which as a graduate you can exert; the duty of the graduate in this respect is plain, and still further, by a perfectly natural process, we may come to a representative association of the alumni of all higher grade medical schools, with a view to the upholding of a superior standard, and the consequent encouragement of the more highly educated practitioner.

With the growth of clinical teaching, the hospital has become so necessary a part of the medical school, that its double function as an institution for the care of the patient and for the

education of the practitioner, has come to be very generally recognized, and your interest in its welfare, in its support, its government and its protection to these purposes, in addition to the part which you may individually take in its medical and surgical service, is inevitable to you as a citizen.

The hospital of to-day represents in a high degree the organization of effective work for beneficent purposes; it deals with the individual, and has to consider the mass; it stimulates public generosity on the one hand and administers to public needs on the other; it is one of the links between the many who have and the one who has not, and who is the objective point of its whole existence; the directly operative instrument of all this concentration is the member of the medical staff of the hospital, and behind him is the machinery which makes his helpful existence possible.

With this view of the scheme of hospital existence the interdependence of the governing and operating parts is plainly visible, and one of the expedient duties of the medical man who has the privilege of a hospital appointment, is to do what he can to bring them into close and cordial relationship.

As ordinarily constituted the hospital organization includes a board of managers and a medical staff. The board of managers is made up, as a rule, of men in other than medical walks of life, business men trained to consideration of problems of investment, of income and outgo, glad to contribute their part of the indebtedness of life through a channel of helpfulness to which they themselves have not been trained.

Their duties require of them the acceptance of financial obligations which they are sometimes called upon to meet themselves, questions of building, equipment and administration which they have to study to understand, and which sometimes make heavy demands on the time of otherwise busy men; their general inclination is to help the doctor to what he needs, to sustain and protect him in his purpose, and to make the practical exhibition of that purpose most readily possible.

The member of a hospital staff finds himself in possession of an opportunity to indulge his helpful instincts, to satisfy his zeal for scientific investigation, and to learn from practical experience more in a year, often, than he could learn in a lifetime of merely private practice.

He relieves, it is true, many suffering people who could not pay him a fee, but in doing this he does that only which is obligatory upon him as a member of the medical profession, and, through the hospital organization, he does this duty and

pays this debt with an ease which would be impossible were he to depend upon his own resources.

Much has been said to the effect that the hospital with its board of business managers exists for the doctor, because without it the doctor could have no existence. This is only a partial truth; the hospital organization which has grown to its present elaboration from the time of the Knights Hospitalliers exists for the benefit of humanity at large both within and without its walls, and in it the managers and the medical staff have equal though different responsibilities and can with mutual advantage stand nearer together than they often do.

One means by which this may be brought about is the establishment in any hospital of an executive committee with members from both the managing and medical staffs, a committee meeting periodically as well as in emergencies, to consider the effective working of the hospital plant for its double purposes of medical treatment and medical education, and having, as its name implies, within certain variously defined limits, an executive power.

A committee of this kind, the channel through which the interchange of ideas, from different points of view, may flow, is capable of doing much to prevent misunderstandings which sometimes arise, and to economize the hospital expenditure both in money and in effort.

There is one member of the medical profession who has come into it within the last thirty years, to whom you are already, or are sure to be in time, under great obligations, and for whom you are, in the line of inheritance, in a measure, responsible.

You will find her in the hospital undergoing an arduous training and rendering efficient service in the dispensary districts and among your private patients, supplementing your efforts and substituting intelligent observation and trained manipulation for reports of condition, honeycombed with conjectures, and the ministrations of unskilled hands trembling with a personal emotion.

The business of caring for the sick is so serious a business, the margin between success and failure is often so narrow, and the commodity dealt with is so precious, that the best intelligence to be brought to bear upon the transaction is none too good, and personal feeling and personal sentiment can in no wise take its place.

In those perilous waters where life is the open sea and death the lee shore, when the wind fails and the currents suck in

toward the land, there can be but one captain to the ship, but he needs a good crew.

To meet the necessity for more continued observation and treatment of the patient than could be given by the practitioner in his daily rounds, or than could be expected of persons self trained, or trained not at all, the doctor, through the medium of the hospital as a school, called the trained nurse into being as a recognized factor in our community life, and he is therefore responsible that she shall have her fair chance for an adequate education and shall be encouraged and protected as becomes a member of an honorable profession.

As is the case with the medical schools in this country, the hospital training schools are many of them small and afford too little opportunity for clinical teaching, and the effort which is constantly needed to advance medical education is equally required in the nursing profession.

The graduating doctor has the advantage over the graduating nurse in that he is immediately brought into contact with his fellows through his medical societies, maintaining meanwhile his freedom of action, while the nurse has, until very recently, had no such provision made for her affiliation and finds her only relation to the medical profession through the individual doctor with whom she is in service at the time.

The recent establishment of Alumnae Associations has done much to correct this condition of affairs for the graduate nurse, and to relieve her of that solitary life, which, while it fosters self dependence and strength of character, is not conducive to growth; but the Alumnae Associations afford only a partial remedy; like all limited bodies which furnish merely a repetition of the same instruction, they lead to an inbreeding of ideas.

The formation in sufficient centres of population of Graduate Nurses' Associations, including graduates of all hospitals, for self educational and social purposes, with admission of its members to the clinics of the different hospitals, and with limited courses of lectures on sociological and economic as well as on medical subjects, is one of the means by which the doctor can pay his debt for the splendid devotion of many of the women who have put their lives into this profession.

In the preface to his "Social Evolution" Benjamin Kidd speaks a gladdening word which you young men will do well to lay to heart.

"Nothing," he says, "is more remarkable in this period of reconstruction than the change which is almost imperceptibly

taking place in the minds of the rising generation respecting the great social and religious problem of our time.

We have lived through a period when the very foundations of human thought have been rebuilt. To many, who in the first stage saw only the confusion occasioned by the moving of old landmarks, the time has been one of perplexity and changing hope. But those whose lot it has been to come later have already an inspiring and uplifting conception of the character of the work which the larger knowledge is destined eventually to accomplish. That the moral law is the unchanging law of progress in human society is the lesson which appears to be written over all things. No school of theology has ever sought to enforce this teaching with the directness and emphasis which it appears that evolutionary science will in the future be justified in doing. In the silent and strenuous rivalry in which every section of the race is of necessity continually engaged, permanent success appears to be invariably associated with the ethical and moral conditions favorable to the maintenance of a high standard of social efficiency, and with those conditions only."

Whether your opportunities be many or few, your power, little or great, here is a clarion call that bids each man do his best, for apace with the social changes, and a very part of them, has been the influence which the medical profession has exerted, oftener from individual to individual than through any public form of expression.

The lesson of "thou shall not," which is the first course laid in the foundation of permissive law, the lesson of that self denial which is conservative of life, the lesson of that cleanliness which is absolutely necessary to all healthy living.

To live in a community and know only the needs which knock upon the door, to pass festering lanes whose heavy air means more than bodily deterioration, to know the shame that walks the streets, the crime and the misfortune that fills the almshouse and the refuge, to look upon the last resource the coward knows, and then sit at ease and wait—it is impossible.

Inasmuch as it has been given you to know these things, these other things you must do, "comfort and help the weak-hearted and raise up them that fall."

No walk in life affords greater opportunities for the fulfillment of this injunction than that which you have chosen, and, in addition to the immediate practice of your profession, you cannot fail to find some outlet for the desired expression of your citizenship in ways to which you have been trained. Every-

thing which affects the health of the community, much that has to do with its morals, is by your right as a physician, by your duty as a citizen, more or less your concern.

One of the growing reforms, through which you can work as a means to many good ends, and which appeals to you particularly as a physician, is that of physical education.

The play and game instinct which Froebel so deeply studied and which finds its expression in the organized athletics, not only of our colleges, but in numberless educational institutions, clubs and societies all over the country, is one of Nature's leading strings which it is wise to wisely follow, and the very existence of the instinct, giving a common meeting ground to all sorts and conditions of men, makes it a valuable field for the cultivation of other than merely athletic aspirations, while the organized physical training, as applicable in educational and reformatory institutions, is an important adjunct to other teaching, in strengthening something more than the muscles, and developing something more than the intellect.

Physical training, on the gymnasium basis, which had its first impulse in this country from German sources in 1825, has so far developed within the past thirty years as to justly claim a place in any educational scheme looking to the production of the best intellectual machine. That this impulse has not been confined to any limited portion of the community, is shown by the fact that there are in the United States over one thousand gymnasiums for physical training and six gymnastic normal schools training teachers only.

The place and duty of the doctor in relation to this branch of education are evident; it has been his business to learn the capabilities of the human body, and he, better than any other citizen, can guard against the abuses, and estimate the value of physical training in the direction of increasing the capacity for intellectual work and inculcating the moral principles of self control and of the expenditure of effort to the best results, which tend to make the useful man.

In the presence of this view it is sincerely to be hoped that there will be in time in each of our colleges a Department of Civics, which shall have for its purpose the training of students in a knowledge of the needs of citizenship, and in which department physical education, either as an obligatory or elective course, shall have a preliminary part, so that, beginning with the lesson that his body is worth respecting for what it is, and worth caring for for what he can do with it, the student will come to learn what, as a citizen, it is worth while to care to do.

As the citizen-doctor *you* have had your preliminary education and your work is ready at your hand; you will find it incumbent upon you to stand among other things for the integrity of your own calling and to wage that steady and ceaseless warfare in behalf of the weak and the ignorant, against the charlatan and extortioner, and more strenuous and persistent still, against the recognized member of the medical profession who basely sells, either at private hand, or in the witness box, the honor he is not fit to bear.

You will be called to serve your country in the field, and will go not only willingly but gladly; or none the less gladly, your service at home in the fight against demoralization and disease, will find its expression in Board of Health work, the medical inspection of schools, questions of special provision for compensatory education for cripples, of the provision for the care of waste humanity, that fringe and tatter of city life filling our public institutions, questions of food supply, water supply and drainage, and of the just and discriminative distribution of medical charity, all these, and more, are yours to consider, and are among your possible lines of usefulness as citizens.

And now, gentlemen of the graduating class in medicine, "*crescit laete*," that which you have had within your college walls, and which is so dear to you, you will always have, unless you lose it through disuse.

You have a great service before you; you are going out, as each one of you realizes, to a ministry,—a ministry to which you cannot be equal, of which you cannot be worthy, unless you hold it to be, each to yourself, in your own estimation of it,—a priesthood.

SKIN ERUPTIONS OF MALARIAL ORIGIN.

BY R. A. McDONNELL, M.D., NEW HAVEN, CONN.

The mere coincidence of two diseases in the same individual is, of course, far from being proof of their connection with one another. And in a locality where, during half the year, most of the inhabitants suffer from occasional manifestations of malaria, the presence of other diseases at the same time would excite no particular comment, were it not for the fact that certain ones exhibit the same periodicity as the malarial paroxysms, are benefited by the same treatment, and are liable to recur at every subsequent malarial attack. Take for example herpes febrilis. In an ambulatory patient, seen in the spring, summer, or autumn, herpes febrilis is presumptive evidence of the existence of malaria, before a single word has been spoken. It occurs more frequently in this disease than in pneumonia, and as for the old name "cold sore," signifying a connection with coryza, it is in nine cases out of ten a misnomer.

Go a step farther. If untreated, herpes febrilis is almost invariably followed, in a child, by the appearance of a crop of pustules on face and hands, due to auto-inoculation. The attack of impetigo contagiosa thus inaugurated is plainly, then, an outcome of a malarial attack.

While herpes febrilis is, doubtless, the most characteristic malarial eruption, other skin diseases which are also brought about by malaria through the agency of the nervous system are by no means rare. Such are herpes zoster, urticaria, neurotic forms of eczema, and chloasma. These, with the exception of neurotic eczema, are most frequent during the time of year when malaria is most prevalent. In the case of herpes zoster, it will be found upon inquiry that very many patients suffering from this disease have recently had old-fashioned chills and fever, and certainly quinine is our sheet anchor in the care of these patients. The form of zoster most frequently observed is intercostal, though I have seen two cases lately of the genito-crural type. Herpes zoster is one of the diseases which seldom occur more than once in an individual. Yet Kaposi has reported a case in the Wiener Medicinische Wochenschrift of nine suc-

cessive attacks, accompanied by chills, in one individual, and two abortive attacks afterward. Tilbury Fox attended a patient who had several attacks, and always in the summer. Colombini, reported by Duhring, relates a remarkable case of zoster in which the eruption was universal, following the cutaneous nerves of the entire surface. The patient was a man, thirty years of age, who three years previously had had an attack of malarial fever lasting several months. At the age of thirty he had another attack of malaria, accompanied by intense neuralgia and a burning sensation all over the body. Within a week of the beginning of the malaria the zoster appeared. Besides the cutaneous eruption, there were vesicles upon the conjunctivae, and upon the nasal, oral, and anal mucous membranes.

Recently a case has come under my own notice, where the patient, a young man, was cachectic to a degree from malaria, and suffered from actual chills and fever. He had a typical intercostal zoster, called it "shingles," and stated that for the past four years he had had a similar attack every summer.

Among the toxic effects of arsenic, administered in considerable doses for some time, is herpes zoster. So that it may be that some cases, which at first sight seem to be malarial in origin, are only the result of arsenic administered to cure that disease.

Urticaria is an affection most prevalent during the malarial months, but other causes than malaria are, of course, frequently responsible for this. Mosquitoes, indigestible fruits, fish, bed-bugs, all these are more active as causes of urticaria in the summer and fall than at other times. But can we not all recall cases of recurring hives which we are sure were not due to these, and which got well when we cured our patient of malaria? Crocker, Shoemaker, Bronson, Jackson, Hyde and other authors mention the possibility of urticaria as a symptom of malaria, but no writer to whom I have access has more than merely mentioned it. In New Haven I am sure it is very common. I will cite one case. Mr. V. A., aged 52 years, was examined April 5, 1897, and found to have a skin markedly eczematous from scratching, and a fresh crop of urticarial wheals. He complained also of chills and fever, and stated that an hour or so before the occurrence of a chill, big red blotches would come out and itch furiously, and would continue until he had begun to sweat, when they gradually disappeared. The chills were of the quotidian type, and occurred about an hour later each day than the day before. This man had taken quinine, but not enough. He was cured of his chills and fever, and the hives

also stopped. But I have recently learned that on every seventh day for some weeks he was troubled again with hives. This periodical reappearance of urticaria chronica has been mentioned by several authors. It is an interesting fact that one mosquito bite may cause a rather profuse attack of urticaria; and since it has been proven that the mosquito may serve as an intermediary host for the plasmodium malariae, is it not probable that either the plasmodium itself, or some of its products, is injected by the mosquito, and that the first noticeable effect is urticaria?

A complete analogy to urticaria is the angio-neurotic oedema of the face—a sudden swelling which sometimes closes the eyes completely, and which many of us have seen during malarial attacks.

The neurotic type of eczema is characterized by a sharply outlined patch of vesicular eruption, bright red in color, itching intensely, and but little modified by external treatment. Careful study has enabled Dr. Bulkley to find specific causes for this in many instances. A patient of mine, a lawyer, has such an eruption on his hands after every indulgence in sexual intercourse. Another has exacerbation and amelioration of the eruption entirely coincident with malarial attacks, which in this case have been tertian in type. It is very characteristic of eczemas in general to improve under indifferent treatment up to a certain point, when suddenly, without apparent cause, the work of several days or weeks will be undone in a few hours. In such cases it is well to think of malaria, and quinine will frequently prove beneficial. In fact, it is the personal opinion of the writer that quinine is a more valuable drug than arsenic in the treatment of eczema.

Chloasma, of a peculiar coloration, is very characteristic of profound malarial poisoning. It has a greenish tint which is different from the chloasma due to other cachexiae. This we have all seen and would probably recognize anywhere. But the most extreme development of malarial chloasma occurs in India, in the Assam hills, where Dr. Clark has described it as "the black disease." Arsenic should not be used in the treatment of malaria complicated by chloasma, as it is well known that arsenic itself will intensify any existing pigmentation of the skin.

The foregoing diseases—herpes febrilis, zoster, eczema neuroticum, urticaria, angioneurotic oedema, and chloasma have one thing in common—a nervous element: it is possible to evoke every one of them—perhaps not exactly at will—by adding

some foreign matter to the blood which will produce an irritation of nerve endings or of nerve-centers. And this is probably the *modus operandi* of the malarial cases. Either the plasmodium of Laveran, or some of its products, acts with special virulence on the most highly organized tissues, and gives rise, according as this or that structure is most affected, to the different eruptions mentioned. But the nervous tissues are not alone influenced by the malarial organism. The glands of the skin and the walls of the blood vessels are also affected, giving rise in the one case to *miliaria rubra* and *sudamina*, and in the other to *purpura*.

Prickly heat, or *miliaria rubra*, is one of the most troublesome of the summer eruptions to cure, although a great variety of remedies will alleviate it. It consists of a catarrh of the sweat ducts, due either to retention and decomposition of the sweat, or to the elimination through the sweat-glands of some irritating matter. In malaria, elimination of toxins undoubtedly occurs through both the skin and the kidneys. As a matter of fact, prickly heat is very common in malarial patients, and the removal of the malarial element is an important measure in the cure of such cases. After that is done, alkaline diuretics and a bland local application like calamine lotion are serviceable.

In regard to *purpura*, the demonstration of a malarial causation is, occasionally, not at all difficult. The occurrence of hæmaturia, menorrhagia, epistaxis, and other hemorrhages is sufficiently well known in this connection. And diarrhœa accompanied by the discharge of some blood is a rather common symptom of malaria. *Purpura* has long been known as a symptom of many cachectic states, as scurvy, phosphorus poisoning and snake bites, and Kolb, Tizzoni, Giovannini, Finger and others have found bacilli and cocci of various kinds in the blood of purpuric patients. All this goes to show that no one cause is responsible in all cases, and furthermore, that several kinds of bacteria have been known to cause the disease. *Purpura* is probably a much less common complication of malaria than the other skin affections mentioned, but it has occurred in unmistakable connection with that disease in the practice of the writer.

There are several other skin diseases where malaria has been suspected as a causative agent, but the relationship has not been so demonstrable as in those mentioned. Such are *erythema multiforme*, *dermatalgia* and *pruritus*.

If what has preceded is accepted as approximately true, it will serve in a measure to indicate what a protean disease malaria is. Eight distinct affections of the skin are certainly caused sometimes by malaria, and four or five others are possibly brought about through it. In other words, its skin manifestations are more diverse than those of syphilis. And the analogy with syphilis does not end here. Profound changes are brought about by malaria in the internal organs and the blood, no whit less deadly than those wrought by syphilis, as witness the deaths of patriots within a couple of months from sequelae of malaria. Furthermore, there was a time when it was a simple matter to treat syphilis; when the diagnosis was made, the patient took calomel until his teeth fell out. Now, things are different. And so it should and must be with malaria. Quinine is our best remedy, but our whole duty to the patient is not performed when we make his ears ring. Careful consideration of all the symptoms is demanded, and an adaptation of measures suitable to the conditions present.

But the main object of this paper has been to direct attention to the importance of the recognition of a malarial element in skin diseases where such exists, and particularly in the more common skin diseases. There *are* on record certain anomalous eruptions apparently due to malaria, but these are of so little practical importance that they will not be considered here.

In conclusion, then, the diagnostic points in a malarial eruption may be set forth as a distinct periodicity; a coincidence with other well-known malarial symptoms; improvement on the administration of quinine; prevalence in malarial localities and during malarial periods of the year; and, finally, the tendency to attack new comers rather than old residents, who may be supposed to be, to a certain extent, immune.

ACUTE FRONTAL SINUSITIS.*

BY HENRY L. SWAIN, M.D., NEW HAVEN, CONN.

There is quite a common impression that acute inflammations of the accessory sinuses of the nose have been more frequent than formerly since the prevalence of La Grippe year after year in our midst, and it has been my own impression that the acute inflammations of the frontal sinus have been decidedly more frequent than acute trouble in any of the others.

Last year we had in New Haven during the winter and early spring two distinct little epidemics of influenza, and with that strange and inexplicable faculty which this queer disease has in singling out certain parts of our organisms upon which most actively to inflict itself, there was a very much larger average of frontal sinus affections than I have ever seen before. Still more curious was the fact that there was an apparent localization to certain districts, or classes of people, as will be best evidenced by the statement that twelve of these cases came to me referred for treatment from the practice of one physician, and several of my own cases, and five others referred by other physicians, came from the same local influences as did the other twelve. Among my other cases were, however, a number from out of town, so evidently New Haven did not suffer alone. This sudden influx of so many cases naturally led me to become most interested in this trouble, and the study and thought which followed make the only excuse I have to offer for burdening you to-day, gentlemen, with this brief paper upon a subject which confines itself to so small a part of this body of ours.

To prove whether my impression was correct as regards an increased frequency of the acute frontal sinusitis, I looked over my case books for the past twelve years, and found, excluding the last year when there were so many, that there is year by year a distinct increase, so that the winter of '96-'97, for example, has three times as many as the year '92-'93, and previous to the first grip invasion such inflammations were an infrequent affair. It will therefore be fair to infer that if we continue to

* Read at the annual meeting of the New York State Medical Association, October 19, 1898.

have yearly inflictions of the influenza we may also expect the various observed local inflammations. I do not imagine that my limited experience has any wider application than any other single observation, nor do I expect this year to have nearly as many cases as last, but what I do infer is that the upper air passages, like certain individuals, seem to have a diminished resistance incurred by repeated attacks of the disease, and consequently the future will see more sinus affections rather than less, unless the dread disturber vanishes as suddenly as it came, and who shall say it may not.

"A simple cold in the head," says a certain patient who, notwithstanding he feels pretty badly, thinks that for such a trifle he will not consult the family physician, and retires that night with his nose feeling very much stopped up, and with more pressure in his head than he ever had before. Either then or in the night he suddenly feels an aching, perhaps first in the eye of the side affected, for it more often is but one, and if accustomed to ocular headaches he assumes that he is in for one of these comforts. He is frequently awakened in the night by the pain in the head, and before morning is conscious not only that his head aches, but that the forehead over the eye is aching harder than the rest, and is tender to pressure. By morning, or during the day, he frequently finds that the portion which aches hardest, and is most tender, is also a trifle swollen and often is hotter than the other side, as well as redder. During the night he has been conscious that he is blowing very much more mucus from his affected side than the other, and that it is completely stopped. During the forenoon he is utterly unable to do any work, the slightest jar, or stooping, or mayhap, if he has a cough, the merest clearing of the throat sends an agony of pain to his forehead. He cannot use his eyes because of the marked watery condition which any use augments. Near work causes his head to ache harder. The discharge meanwhile has been increasing until along about ten o'clock, when it reaches its maximum. Between now and afternoon, sometimes slowly, sometimes suddenly, there is a marked letting up of the pain, preceded by the flow of a very large quantity of thin pus, or muco-pus, frequently, when the let-up has been sudden, colored with blood. With the letting up of the excruciating headache the patient feels easier in every way, and by late afternoon is commonly quite comfortable. He can even read a little, and slight jars do not disturb him. In fact he feels so much better that he thinks the worst is over, and congratulates himself on his

splendid good sense in that he did not take his wife's advice and call in the family physician. He still has a bad cold in the head, feels feverish, and the affected side still discharges freely. During the evening his confidence in his progress, and in the aforementioned good sense, is somewhat shaken by occasional reminders from his head, and before morning, or on arising, the same grinding headache is there with even more vehemence than on the previous day. His experience is usually severe enough now to lead him to his most favored physician. If not, by afternoon he again has some sense of relief, and sometimes, without any medical aid, may go through several days of less and less aching. Thus gradually the attack subsides, becoming soon but a disagreeable memory. Other cases seem to go on day after day in such agony that they are compelled to seek relief, and many unpleasant sequelae of the acute trouble are to be found in neglected cases.

Of course this typical attack which I have described may have any number of variations; oftentimes the ocular symptoms are so marked that the oculist is consulted, especially in the case where the disease becomes sub-acute. The one-sided discharge is frequently ascribed by the patient, and even sometimes by the physician, to the natural flow of tears into the nose. Some severe cases have continued pain for days without the relief, which was referred to previously as occurring sometimes in the middle of the day, and such cases are among the most unhappy of mortals. Some of these indeed may have absolute cessation of all discharge and may develop most alarming symptoms from pressure. Sub-acute cases seem more prone to lead to a chronic discharge than the more stormy and violent ones, which latter I have known to clear up with one sudden gush, and a few days of increased discharge from the affected side. In other cases we have prolongation of the symptoms due to complications which occur all too easily with the ethmoid and maxillary sinuses. When the chronic pus formation has once become established there seems to be no limit to the length of time which it may exist, and complications are so liable to arise with the other sinuses that it is very rarely that we are called upon to treat only the frontal.

Now what has happened to the poor afflicted mortal with the acute sinusitis is apparent and well known to you all. Some condition in his nose, or in the nature of his infection, however, determined why he should have had a frontal sinusitis out of what in his neighbor was a simple coryza. Why did in his

case this infection get away up in that by and forbidden path and such dire consequences result? That none of the other sinuses are involved, I take it must be some anatomical peculiarity which determined its selection. But we must first inquire what transpires when any of these accessory sinuses are acutely inflamed. It seems fair to assume there exists first a violent, or I might better say wide-spread congestion of the nose, and this undoubtedly always involves the mucous membranes lining the more adjacent sinuses. There is some evidence that the maxillary sinus is more frequently involved in acute processes than is commonly supposed, and it would not surprise me if systematic illumination of that cavity would show, as I know it in a few cases to have done, that in any severe cold with profuse discharge there is a congestion of that cavity. This is inferred by the poor transmission of light which in the same individual is very different when the cold is gone. Supposing, therefore, that the congestion exists in the frontal sinuses it is quite reasonable to suppose that they are frequently equally congested, and yet one gets infected and the other not. Presumably the variations in the canal of outlet may account for this or that sinus being afflicted. I can from my own observation state that clinically I have found the nostril affected to be different from its fellow, in that it is almost always narrow in the upper part. Or there is malformation or absence of the middle turbinate, or hypertrophies or polyps exist, any, or all of which, would suffice to make this easier to become inflamed than the other side. Without putting it too strongly, it has seemed that in every case some lesion was present, the influence of which was to narrow the outlet from the frontal sinus, or there were modifications of the canal itself. No two of these passages are alike, and all degrees of patency seem to exist in subjects who have remained healthy. From the above one might readily believe, then, that disease of the middle turbinate region making these parts readily inflammable under sudden coryza may create foci of infection near the opening of the canal. This would lead to congestion of the interior of the sinus. The latter will usually, then, under such conditions have some secretion, and if this cannot readily escape from the canal, retention of but a few hours would be sufficient for this to become infected, pus would result, and then follows the entire clinical picture which we have described. I have never seen a case of frontal sinusitis previous to the formation of pus, consequently it is assumed that unless infection actually takes place, as is also the case with all

the sinuses, neither the patient nor his physician are cognizant of the existence of any trouble. Secretions having once dammed up inside the sinus, pressure occurs, and this leads to venous stasis of the surrounding membranes in the nose. These swell and thicken, and we almost never escape the formation of granulation tissue, and even polyps, where previously nothing but plain hypertrophy existed. This new tissue blocks the canal still more, and thus an effect becomes a further cause of trouble of the same kind which produced it. Just how much the micro-organism has to do with this affair I am not in a position to say, but this much is certain, that nasal mucus itself is secreted sterile, and the first effort of nature seems to be to throw out large quantities of it. Micro-organisms present are thus washed out. Given, however, retention areas and immediately there is a chance for the germs to multiply, and anon we have muco-pus and pus. Should this process of infection of the mucus take place near the opening to any of the sinuses it is but a step to enter and infect this remote part of the nose. The discharge from sinuses seems always to be purulent and hence contains micro-organisms. I would like, therefore, before leaving this point to emphasize the fact that it seems probable that our germs, having neither wings nor yet legs, cannot by any accident suddenly find themselves way up inside the frontal sinus, but that the blame must rest upon the existence in the neighborhood of the opening of that sinus of some pathological or anatomical condition favorable to the development and propagation of these organisms, and from this comes the very eminently plain deduction that our prophylaxis must lie in the removal of such conditions.

It has been mentioned that the secretion comes at some times of the day more than others, and this is not only because the outlet is sometimes more open, thus allowing of a freer flow, but there is actually more secretion formed in the sinus at one time than another. For example, in chronic cases of empyaema of the maxillary sinus the patient will find in the afternoon, on washing it out, that he has absolutely no pus in his antrum. He will arise in the morning and also find none, but by noon enough will have been formed to fill the entire cavity and overflow out into the nose. This same thing happens in acute cases, and I believe this explains, apart from the actual stoppage of the canal, why in cases of acute frontal sinusitis the morning pain is frequently so extremely intense. The only explanation of this phenomena which suggests itself would seem that at night, while sleeping with the slowed circulation, all metabolism and

cell reproduction is slowed up. Then upon the individual's arising a much greater activity of the circulation causes the pendulum to swing in the opposite direction and everything is most active in its reproduction, so that after the individual has been up and moving about for three or four hours there is actually a very pronounced increase in the amount of pus formed. Whether this circulatory theory is true or not, this larger amount of discharge, in the case of the frontal sinus, must go through the same opening through which a smaller amount has been passing, and consequently there must be retardation of the flow and pressure, and herein we have an explanation of the sudden increase which we periodically have in the pain in these cases. We also have to remember that we are dealing with a membrane where there is erectile tissue, and that the ebb and flow of the blood in it inevitably causes a change of volume, so that a granulation, for example, which would merely impede the flow of pus, would, in the engorged condition of the membrane, act as a ball valve, completely blocking, for the time being, all exit.

That complications arise from having this discharge running down into the nose would seem scarcely to be avoided, especially if we think how thin the walls are which separate the posterior part of the canal from the ethmoid cells. It opens into the hiatus semilunaris, just above and in front of the opening into the maxillary sinus. We can add to this fact another, which is that when one pours a fluid in through a hole in the front wall of the frontal sinus in a skull, it will find its way almost invariably into the maxillary sinus. It would, therefore, seem really providential that every patient with frontal sinusitis did not, before he got it cured, have also inflammation of the antrum of Highmore. The only thing which could prevent such an accident would seem to be that the swelling of the tissues due to inflammation blocks off the antrum from the rest of the nose.

The diagnosis of such cases as we have under consideration is usually easy. When a patient presents the one-sided headache, tenderness, redness and swelling of the frontal region near the root of the nose, and has, with all, a one-sided mucopurulent discharge, it is quite plain, and safe to assume that the patient has at least a frontal sinusitis if nothing more. Confusion might arise from the fact that occasionally a discharging maxillary antrum may bother its fond possessor with occasional frontal headache even in the chronic state, or such a patient may have a supra orbital neuralgia, or median headache might

accompany an ethmoid trouble. But by carefully locating the tenderness by feeling just under the orbital ridge, and quite close to the nose, it will be safe to assume that you have to do with a frontal sinusitis. Examination of the nose will usually reveal that pus is present and that it tends to come from the front part of the middle turbinate region, and occasionally one can see it actually flowing out of the region of the outlet of the frontal sinus. However, the only safe way of judging any sinus to be acutely or chronically inflamed is to see pus flow out into the nose following the probe which has been introduced into its natural opening. You are then absolutely sure.

The prognosis, with treatment, is good, and where it is possible to remedy predisposing causes or conditions we can promise fair immunity from subsequent attacks. Frequently, however, without treatment the case will get well, and that is due to the fact that the drainage from the cavity is good when once established, whether by nature or by art.

Our treatment is plainly indicated, first to relieve the general constitutional conditions by the usual methods, never failing to reduce the trend of blood to the head by every reasonable means. A saline cathartic is almost always indicated. Locally we try by every means to keep the nostrils free from mucus or pus, and to secure the freest possible drainage to the sinus. To the first end, cleanliness, hot fluids are most valuable, both from the flushing which their use involves, and also from the heat itself. Hot normal saline solution is freely flooded through the nose, preferably by snuffing it up. Hot water externally over the sinus, as in hot water bags or hot water coils. Of course if one could see the disease very early, ice may abort a serious inflammation. The earlier the blood letting takes place the better. It may be local in the nose or by leeches externally. If the nostril is tightly stopped, spraying with Seiler's tablets in solution following the hot salt douche, both cleanses and reduces tumid turbinates. Cocaine under stress of circumstances, by virtue of the fact that it always will cause erectile tissues to contract, can safely be used occasionally by the physician himself, but should never be given to the patient to use unless as a most rare exception. It is nowadays very feasible, and will help very greatly in establishing patency of the nostril, to use first, oneself, the cocaine in small amounts, and follow it closely by an aqueous extract of supra-renal glands. This latter the patient can also be allowed to take home with him, and by repeating its use can keep a nostril open to its

maximum for a number of hours. The greatest possible widening and freeing of the nostril by the shrinkage of the turbinates follows the combined use of cocaine and supra-renal capsule extract. While the patient is under the influence of both, the medical attendant can frequently relieve the distress immediately, by probing into the frontal sinus canal. This is usually feasible, and when repeated daily gives the patient the greatest possible comfort. The probing usually reveals sooner or later granulations, hypertrophies, or polyps. These, if present, should be removed at the first sitting, and with a sharp scoop all the granulation tissues removed from the region of the opening of the canal.

By following a routine in keeping with above suggestions the patient will usually keep himself in as comfortable a condition as is consistent with the severity of his case. He may in addition get a considerable relief by the insufflation of dry boric acid. This latter should not be used in large quantity, and will tend to keep the discharge fluid and prevent any retarding of the flow from the sinus, which a viscid mucus can readily do. Patients should repeat the cleansing process every three or four hours as symptoms urge, and are better seen daily. When the headache is unbearable, medicinal treatment will ameliorate it. Rarely in acute cases, and then usually in what are but acute exacerbations of chronic trouble, is one called upon by the severity of symptoms, such as threatening meningeal trouble, to make an artificial opening. This may be properly done by trepanning front or lower wall, and having broken down all impediments to free drainage into the nose, scrape out the diseased tissue within the sinus, insert a drainage tube of soft rubber through the infundibulum into the nostril, one can close the external opening and frequently allow it to heal up without serious trouble, either from the treatment of the wound, or with the scar which it leaves behind.

If I have aught to say in summing up this somewhat lengthy description of a very distressing disease, it is to encourage local treatment. I do think we can accomplish quite as much thereby in these cases in the way of relief and comfort to the patient, as it is possible for us to do in any other distressing acute inflammation.

MYSTERIOUS DEATHS.

BY GEORGE L. BEARDSLEY, A.M., M.D.,
Medical Examiner, Derby, Conn.

It goes without debate that it requires little skill to pronounce a person dead; it is a far different problem to tell why he died. Into the causes of one's decease a close study is often important, and frequently the verdict is a crude guess or a conventional phrase. "Heart failure" is a clever and safe inscription on any tomb; the physician who writes on a death-certificate "want of breath" as the cause of an untimely leaving is often nearer the truth than the legion of findings catalogued as heart-disorders. In the days gone by, when the medical oracle of the town could not announce with any certitude why an unlooked-for death occurred, or when a body was found in the woods, in a room in some tavern, or by the wayside, a court of twelve men was summoned, not one of whom in all probability had a ghost of an idea of the mechanics of dying, and the trite and hackneyed summing up of the testimony, as death due to "causes unknown to the jury," satisfied the law and quieted the excited community. It is a sign of progress that we are now sifting events and reasoning from surroundings. There is no more convincing proof of a thoroughness and determination to get at the facts, the why and wherefore of daily happenings, than the stern intent of some of our recent laws to find the explanation of accidents, sickness and death. A hundred years ago a child could have been smothered out of existence, poison slyly administered, and more than one of the family buried without even public gossip thereon; a person could be drowned or a body found in the woods, and the finding "sudden death" slightly questioned or quietly accepted by the credulous. Strict requirement is to-day made of every doctor to look into all the circumstances of a death, and if he is not well satisfied, to refer the case to a coroner or an officer who is proficient in medical jurisprudence. This is a guaranty to every community that human life cannot be trifled with, and that while all must die, they shall not be martyrs to criminal negligence, nor victims of some outrage. If an experience covering more than

thirteen years in investigating untimely deaths can furnish a few hints to help medical examiners in their researches, this paper may not be impertinent.

My first observation is that a hasty decision is always a temptation. The inclination is quite easy when a person is found dead, and when there are no apparent motives or plausible pretexts to delay deciding, to make out a report of "heart disease." He may do this honestly; he may think further search too arduous for what there is in it; he may fear if he hesitates long it may seem as though he was criminating the immediate relatives or friends, or judging them unrighteously. A case from my record-book is just here relevant. A colored woman had given birth to a child which died soon afterward. Little was remarked about the matter, as stillbirths are not generally tea-table topics, but in a few hours it began to be whispered there was a "nigger in the fence;" an infant was dead, and there had been no doctor, no certificate, and an investigation was necessary. On reaching the house, after some warm expostulation about the truth of the situation I succeeded in extorting from the mother that she had been delivered of a dead child, but that it was not to be seen. The inmates refusing to disclose the whereabouts of the body, I made a hunt through the rooms and at last happened to find the child, wrapped up in several rolls of cloth, on a shelf in a closet. In a hasty examination there was no peculiar visage to this from other stillborn babes; there was, however, a strange dent on the left face and another on the nose. Putting the face under a strong lens I made out the abrasions or marks to be the imprint of finger-nails. The child unquestionably had been suffocated soon after birth.

A still stronger case *in re* I desire to relate,—the startling death of a girl twenty-three years old, about whose previous health no unfavorable history could be elicited. The inquiry showed that on the evening prior to her death she was in her usual mood; retired at ten. The following morn she rose, dressed, put her room to rights and then took a walk in the yard. Returning, she seated herself at a window in a room adjacent to the kitchen where the family were breakfasting, informing the mother she wanted nothing to eat. Breakfast over her mother repaired to the room where the girl was supposed to be, and, to her surprise, she found her daughter gone. A tour through the house revealed the girl lying on the bed in her sleeping apartment dead. Despite hours of work on this case I obtained no evidence inculcating any one, still less a

motive for her untimely departure. Rumor was rife that she might have put an end to her career because of her repugnance to her marriage, which had been "called" for the following Sunday; there was not a scintilla of evidence of suicide save dame village gossip. My report was, however, deferred, and after two days digging for *praecognita*, this was learned, that the girl had for some time been drinking and abusing her health; there was odema of the ankles and good evidence for hypothecating albuminuria as the predisposing cause of a convulsion which seized her, (she was not fully dead when first discovered). Such a verdict surely could not have been reached in the usual time a medical examiner devotes to cases where foul play is precluded by a keen study of the surroundings.

While citing instances patent to the trend of this article let me adduce another even more striking one where had not a most thorough method been employed, the cause of death would have been relegated to the domain of the mystical. A man was discovered dead in bed; he had been a veterinary,—for some time had no work, was in debt. On a shelf of a medicine-bureau was found a bottle half full of laudanum. In the absence of any other evidence of a possible suicide but the finding of the laudanum, there was built up a theory that as there was every reason why he should kill himself he must have done it with the deadly drug because that happened to be in the room. It should be added that a tumbler and spoon were lying on a chair near his bed. An autopsy was ordered and a clot in the brain with considerable extravasation was revealed. Without such a search-light, a verdict of suicidal poisoning would have been plausible and the public would have emphatically seconded such a finding.

Another or the second deduction from my scrutiny of nearly two hundred and fifty bodies, is that there are many insidious or undiscovered diseases of organs other than the heart. There are not a few who call themselves in perfect health, without an apparent infirmity, who, when subjected to a rigid examination for a life insurance in a first-class company, are weighed in the balance and found wanting. It is my conviction that there are diseases of the kidney slyly and unsuspectingly sapping the energy of many an individual. In cases where we are required to make tests of urine for a life-insurance the surprise of such revelations causes many a medical examiner to hesitate sometime before declaring any body sound. Some time since a gentleman, whom I had for years known, came up for a life-insurance examination. The usual questions on the blank were sat-

isfactorily answered, the physical sounds of the chest were normal, the heart behaved correctly, the family history was specially good. Had not a test of the urine been demanded, he he would have passed, for up to this time the applicant was thought to be a perfectly sound subject. There was, sad to relate for him, some albumen in the urine, and of course the blank could not be completed. Thinking the presence of albumen might be transient another call was suggested; again the urine was tested and the same results obtained. It is putting it lightly to say the applicant was surprised—he was more than that, he was incredulous, and of right so, as other doctors had pronounced him a well man. To fortify myself, and to do him justice, I forwarded a specimen to the Chief Medical Examiner of the Mutual Life at New York and in a few days came a letter fully confirming my analysis.

The more one comes face to face with the dead, who leave no clinical history behind, the more suspicious does the looker-on become of the cause. One might almost construct an aphorism that few die naturally without some preliminaries and that those who step out in an unusual way do so for unusual reasons. A person struck down as though by a lightning bolt because of some heart infirmity of which he had been forewarned dies as naturally as though he passed out in the convulsion of Bright's disease. We are not in ignorance why it happened—there is no enigma, no marvel about it save the time or circumstances attending it. A man to all intents or appearances of full vigor with no "record of sickness or medical care" drops dead or is found so. This sort of paying nature's debt is unusual, is inexplicable by any code of signs that is known.

The first class of cases perhaps that vex a coroner is deaths after a very short illness where the symptoms have perplexed the medical attendant. Such may simulate poisoning. Several years ago an article appeared over the name of a Philadelphia physician, stating that when he was coroner of that city it was his rule to suspect poisoning in every case of sudden death from cholera morbus or violent gastric sickness, and that autopsies on such persons had so far vindicated him in those surmises that he believed every death under such circumstances to be criminally caused or suicidal. This statement, so startling in the extreme, did this good at least,—it led physicians to be more cautious about a hasty decision and reduced the list of heart-failures on death-certificates. The charge may have been excessively made, but proceeding from such an authority who had the help of autopsies to strengthen or prove his fears,

there was truth enough in it, and treatises on medical jurisprudence now teem with such reports. A trial for murder resulting in the conviction and life-sentence of the prisoner, a woman, for just such a crime, although occurring some twenty-five years ago, is not yet forgotten by the people of my city. A brief reference to this homicidal horror will not be without interest. Lydia Sherman, who married for her fourth husband a widower with three children, in an adroit manner succeeded in poisoning with arsenic, administered in food, the youngest child, one year old, Ada, a girl of fourteen years, and at last the husband. The physician who attended the babe reported its death November 16, 1870, as from cholera infantum. No suspicion was aroused when Ada died, although it was remarked how singular for so robust a girl to die from cholera morbus; her death took place December 31, 1870. When Sherman was taken sick, May 12, 1871, his sufferings were so intense and the symptoms so contradicted any diagnosis that looked specious, that an autopsy was made and arsenic revealed. The other bodies were exhumed, and arsenic found similarly. The woman confessed, soon after her conviction, that she had killed these members of her family because "they were in the way," and it is generally believed that she murdered her other three husbands. Her cunning and suavity completely switched off from the attending physicians' observations every trace of her deviltry.

The story of this trial is a valuable paper to every coroner, for vigilant and informed in his line of inquiry as every one who is appointed to clear up the mists of strange deaths is supposed to be, there is quite a chance he may be deceived, or sidetracked, unless his suspicions are continually kept ahead of his investigations. There are few medical officers who cannot recall sudden deaths where a strong misgiving possessed them that the person died "with outside help," as a wag once remarked to me. The number of fatal cases from uncomplicated cholera morbus, or simple gastritis, are notably few. For an adult, in previously good health, to be suddenly and energetically attacked by a disease which looks like a summer complaint or a lively fit of acute indigestion, but which could be explained equally well as due to some corrosive poison, then to pass into profound collapse and go out of existence in an incredibly short period, is an enigma that should at once suggest the co-labor of a coroner in the sick-chamber.

We must not forget that the higher the mental development of a nation the more likely are homicides and suicides. People

are getting rid of themselves, perhaps while temporarily insane, because of distressing environment or harassing poverty; and then there are legions who are getting rid of their neighbors because of jealousy or revenge, or their dependents because of meagre means to support them, or forsooth a homicidal passion. As a rule not many leave these scenes of trial and activity for the unknown country without quite a fight, or some medical attention; and when a death occurs in a household, or in a hotel, or a boarding apartment, and nothing is known definitely about the sickness or the ailment, the public has a right to know whether any criminal carelessness or an accident or a suicidal freak figures in the obscurity. During the ten years, '83 to '92, in England and Wales, there were 6,616 persons who died from poison, that is, this was the number of those where the facts or the symptoms were positively diagnosed; quite likely there were many others poisoned to death, but there were no tracings of the agent used.

There is still another variety of sudden deaths that is sure to confuse the medical examiner. A hearty, well-developed infant is found lifeless; there is no history whatever of any illness and there is no proof of criminal negligence. How are we to report this death? We shall not greatly err if we try to indicate suffocation as the agent, not intentional more than accidental, and still we will come to the conviction there has been some culpable carelessness. A case on my book runs thus: A stanch babe was put to sleep early in the evening, woke at midnight, and the mother taking it into her bed nursed it to sleep; then depositing the child in a cradle close by the bed, she covered the child with a heavy quilt, in the dark, so that the little one should not catch cold. The mother, tired, fell into a deep slumber which was not broken by the probably stout cries of the suffocating baby. In the morning she found the babe dead under the quilt. As is well known, instances have been cited not infrequently of babes dying from suffocation while sleeping at their mother's side, the bedclothes smothering the infant. Attention is directed to this cause of mysterious death of robust infants, because without a recital of these distressing histories one might imagine such an accident highly improbable.

So far, in this discussion we have, it seems to us, gained a little ground in our gropings after that light we must have to peer or pry into the arcana of the dead chamber. Outside of an organic derangement of the heart, can we hypothecate from the way a person dies why he dies? We note at the start that

dying is not as a rule easy nor noiseless. Unless a sly suicide is attempted, things must have been getting ready, as one might express it, for this event; after it is over, the facts come out and we begin to understand, and all this prompts to the propriety of jotting down a few of the likely or exciting causes of mysterious deaths. Among the likely causes are a disease of the kidney (parenchymatous nephritis); changes in the coats of the arteries leading to or favoring rupture in some area of the brain (arterio-sclerosis); hemorrhages into the brain tissue induced by violent exercise or excitement in the full-blooded; want of nourishment (inanition); concussion of the brain or skull fractures; "knockouts" or chloral served in drinks; epileptic seizures in the night.

A sudden death from uraemia, that is, the retention of the excrementitious element of the urine in the blood, is by no means improbable. It is well known that one of the chronic forms of Bright's disease, the sclerotic kidney, is a malady of middle life, and as it is in its development slow and insidious, it may interfere very little with any function. The victim of this may fall in the street in a violent fit and die in the convulsion. His friends knew nothing of the lesion, and the chances are that the sick one never mistrusted it, for there is quite a period between the first disturbance of urination to the final blast or fury of the announcement of a general dropsy. These are cases of still poisoning, and, as we have remarked, by no means rare.

We note again that it is very probable reports are frequent of death from a disease of the heart where no such lesion existed, but contra, it lay in the arterial tunics or the coats of the vessels. We have in mind those who, about the age of sixty-five to eighty, are stricken with palsy, or, as the common folks say, have a shock. The pathological explanation of such a misfortune is that a blood-vessel in the brain has given way because of some decay or weakening at some point, through a loss or a deterioration of material; the artery has outlived its usefulness. We call this condition arterio-sclerosis, and it is a not uncommon seizure. Had the party been a patient we would have been feeling for thickened radials in his wrist or been mapping out cord-like temporal arteries; we would have warned him that on any provocation one of these hard or calcareous vessels might burst and a big clot for ever interrupt all sensation and motion. Such is a description of those who drop dead after some violent effort or emotional excitement, as rowing in a race, a bicycle "spin," a pugilistic encounter, or a violent declamation.

That a death directly from alcohol is extremely rare, we well know. It has been said that it never occurs except in some such instance as when, on a wager, alcohol has been poured, as it were, into the system so fast that it could not be carried out by the excretory avenues, and we have its lethal effects; the body is soaked and the poison expends itself primarily on the medulla; it stops the breath. Reports of such deaths are exceedingly rare. A statistician, Blyth, finds but three suicides in ten years from liquor. Still it is not an uncommon observance that a man after a protracted debauch remains stupid and never rallies. Just here we ought to allude to a remarkable behavior of alcohol not known to any other narcotic. In a typical case of alcoholic drugging the party wakes up apparently, moves about, and may do one or more rational acts, and then suddenly expires. Death here is not directly due to the alcohol, but to oedema of the lungs or some other pulmonary lesion.

Another possible cause of some of the deaths that perplex us is inanition. The popular way of putting the same is "starved to death." Principally we observe this in infants, for in adults the starvation act is usually suicidal. The babe or child may not be wanted; the parents can ill provide for its sustenance; they may not be murder-inclined nor in a plot to get rid of the burden, but they are certainly not overcome with grief if the little one starves on a meagre allowance or a stingy nursing; they are, to say the least, remarkably resigned to this visitation of Providence. Many an infant, doomed to the cheap and crowded tenements of our large cities, is found lifeless, and there seems no sensible solution of the problem save a scant feeding, or none at all. A similar emaciation might, of course, succeed some such disease as a mechanical obstruction to the indigestion of food, or a mal-assimilation of nutriment, but the environment and the lack of medical care will be valuable aids to confirm our suspicion. My record-book shows several instances of such "encumbrances."

Besides the cases enumerated there are those who drop dead instantly and are generally written up as victims of heart-disease; they are plethoric, often corpulent and are easily excited. A striking example of this variety comes to my memory; the subject was sixty-one years of age and was supposed to have a cardiac insufficiency; he was in the act of opening the door to a doctor's office after ascending a flight of stairs when like a shot from a gun he fell to the floor, expiring forthwith. His was unquestionably a death from cerebral hemorrhage and the tear

in the vessel was due to the increased tension in the effort of hurriedly walking and climbing. A history even more pathognomonic is that of a gentleman of violent temper who in a spell of rage at an obstreperous horse died in his carriage in the act of inhumanely thrashing the animal. Deaths after a tremendous exertion, as lifting a heavy weight hurriedly, or a hot chase to catch a train, or a mad scrimmage as a football-tackle, or even a race on foot are familiar items of news. While writing this article the sad telegram announcing the death of the pastor of my church was followed by a dispatch telling of the details, which were as follows: the reverend clergyman, of beautiful physique and carriage, full-blooded, resolute, had just completed a bicycle ride on a hot morning, when dismounting and resting in a chair in a friend's house, he became stupid, stertorous and purple. Heart disease was of course predicated by the relatives, but the family physician, with myself, demonstrated the fallacy of such reasoning and very correctly diagnosed a cerebral hemorrhage. In all such instances there is a sudden swell of the current, the heart acting with extra vigor or in a hypertrophied condition possibly forces too fast the blood through vessels that give way to the strain. These do not die, as the masses imagine, from a stoppage of the heart-beat; there has been a burst in one of the pipes from too much steam; it was not the fault of the boiler.

As respects epilepsy the previous history of the party, if we can secure it, clears up any mystery, but it is quite possible that a stranger, the subject of such attacks, stopping at a hotel, or riding on a trolley-car, or while walking on the street might be seized with epilepsy and die before a physician could make out a diagnosis. A liability to confound epilepsy in the male with strychnia poisoning should not be forgotten; in the latter case the pronounced rigidity of the body soon after death is significant; Wilkins describes them as stiff as wood.

We come now to the consideration of two topics that ought to interest every medical examiner, subjects that puzzle us and both forms of violent death which mean a crime. We refer first to those who are found dead mysteriously when the history of some broil or scrimmage is in evidence, and yet on the body there are no marks of an injury; the others are the victims of knock-outs or chloral given in drinks. Few medical officers have not been summoned to explore and unravel the death of a fellow in some back-alley, or on the curb, or at the foot of a flight of stairs in a bar-room forsooth or in some dive; the body was discovered where it lay; it is for us to unriddle

the enigma of his taking off and show that it was not an accident. Can we tell much without an autopsy? An inspection of the body may disclose no wounds, no bruises extensive nor serious enough to kill him. At the start we will be warranted in suspecting a fracture of the skull, particularly at the base, and the fracture may not be great nor complete. A hemorrhage from the ears and an oozing from the nose are strong indications of a fracture by contrecoup, and the testimony of an eyewitness that the blow was slight or the fall inconsiderable must not side-track us from the highly sensible theory that the man has a skull cracked at the bottom. Several years ago a fellow was ejected from a saloon. He fell backwards on the stone steps or against the pavement, did not appear to be even stunned by the blow, got up and walked off to his home, (a distance of an eighth of a mile), related to his wife the occurrence; but soon went into a stupor from which he was never aroused; his death took place at three in the afternoon after the evening of the saloon-melee. An autopsy proved a complete fracture of the basilar process or at the base of the skull; the effusion of blood was very copious and had been slow in escaping. In the court which tried the accused the fragments were produced. The importance of this post-mortem search was the establishing of the possibility of a man living and conscious, too, for hours after he had received such a blow.

There are injuries from violence other than cranial which may provoke a speedy death and which must not be overlooked in our examination of the body. Blows on the abdomen, over the solar plexus,—or a kick in the side causing a broken rib to puncture the pericardium or penetrate the lung whereby a concealed hemorrhage ensues, or a homicidal strangulation of a child or an enemy,—all these marks of rough usage call for the closest scrutiny from the medical detective. A clever manipulation of the body may locate the broken rib and help us to decide what organ it entered; there may be a contusion or an ecchymosis over the belly appearing long after the injury; the imprint of finger-nails on the throat or the mark of a cord around the neck may all be read out by a magnifying glass.

The following story from my records well prefaces a consideration of the second class of deaths from criminal intent. A man whose family has employed me for more than twenty years, a periodical inebriate, was found at the foot of the back-stairs of a disreputable boarding house, unconscious. There was no sign of a scuffle, not even an abrasion. My fear of a fracture of the skull could not be confirmed and there was not one symptom of

opium-poisoning. His condition, too, was far from that of a stiff drunk. I was at a loss to understand the situation; no information could be extorted after a very rigorous questioning from the bartender nor inn-keeper. It was not until the next day that the fellow emerged from his stupor; he then recited his whereabouts up to the hour (9 p. m.), when he drank two beers; he said the lager didn't taste natural and he soon felt strangely; his first gleam of consciousness was in the room at his home; he was unable to tell whether he had lost or spent the money he had early in the morning. Two drinks, and he affirmed that was all he had in the saloon, were certainly a light indulgence for a toper who for years had been trained to copious drafts on the keg day in and day out, for his record was that of a fixture in a gin-grocery. Had the patient died without a confession a report could not have been mailed to the coroner that was aught but the conventional "cause unknown to the jury." Here was a sample of chloral-poisoning and it was a lesson to me to mistrust and hunt for evidence of "knock-out drops" whenever a dying or dead carouser was last seen in a saloon.

Deaths from chloral, even when not suicidal or homicidal, are becoming familiar announcements. This hypnotic is employed to a large extent, and the way it kills (by liberating the chloroform in the water-salt and thus benumbing the heart), ought to be universally known. A lethal dose unfortunately leaves no trace behind, and we are driven to some such conclusion, when asked to explain why a victim of headache or insomnia dies in a few hours, after retiring for the night, so peacefully, that he has taken an overdose of chloral, carelessly, we presume.

The purpose of this article has been to display the difficulties which lie in the path of a coroner or his deputy, in ferreting out the particulars of an unforeseen death, and to group such proofs as may be helpful to a medical examiner who must rely on his wits, without any autopsy, to render a verdict of which he need not be ashamed.

Now, in all candor, is the present embarrassment too nice, and accurate findings in the dead chamber necessary? Is the medical officer treated as the merit of his work deserves? His conclusions are final, and they are presumably correct. Are they? We regret to say they never can be as the statute of Connecticut reads. The law expects of us such a ripping up of the mystery that it will clear or convict, prove an accident or a deliberate destruction of life. Is such a summing up of hearsay

evidence and of petty rumors worth much to the State? In too many instances, No. It has already become an opprobrium on a medical examiner, and he is being instructed to "avoid general terms and give the special character of the disease." But how can these terms of indefinite meaning be avoided when a veil shrouds the truth? If autopsies were the rule, not the exception, dead men would tell tales. Not until a law is enacted authorizing a post-mortem examination, whenever a doubt exists as to the motive of the disease, will our reports of sudden deaths be trustworthy or valuable.

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Contributions of matter suitable for publication are invited, and should be sent in not later than the 15th of the month previous to that of publication. The Editors will not hold themselves responsible for the safe return of MSS. unless sufficient stamps are forwarded.

WE would like to again call attention to an article published in the April, '98, number of the JOURNAL on "Why the Experience of Private Practice should be Recorded." We learn by experience, both our own and that of others. "But what is medical experience?" Dr. Thomson remarks: "I unhesitatingly reply only something which has been well recorded, and for the vast majority of physicians only what has been recorded with ink. I utterly distrust the records of memory." We cannot but agree with Dr. Thomson. In this connection, the thought sometimes comes to us that one can really receive more help and instruction from the simple reading of cases reported by the active practitioner, than he can from studying over some lengthy article from the physiological laboratory. In the "Hospital and Clinic Note" department of the JOURNAL we endeavor to make report of such cases and would like to call the attention of our readers to the same, and invite similar contributions. Each year every practitioner meets with cases, accounts of which would be of real value both to his professional brother and the student of medicine. The records of the majority of these cases, if kept at all, never leave the doctor's office. The busy physician cannot afford the expenditure of time and energy necessary to prepare a long article, embodying certain

interesting cases that come under his observation. To these men the JOURNAL appeals. We will gladly publish all brief accounts of cases of general interest sent to us, thereby presenting to the profession invaluable experiences in a concise form, and a printed record of his case to the author.

* * *

THE yellow fever epidemic which is now raging in some of our Southern States, at the same time that we are hearing so much about the sickness of our soldiers in the West Indies, again calls to mind the intimate relationship existing between our sea coast towns and these islands. Yellow fever never has really obtained a permanent foothold on our soil, yet constantly are epidemics of this disease breaking forth in the South, through infection from the Antilles. For a hundred years before 1761, Havana was noted for its salubrity of climate and the absence of epidemic disease. In that year, however, 3,000 of its inhabitants were swept away by this fever; during the next few years thousands of its soldiers and citizens perished, and since then Havana and Cuba, as a whole, have been the hot-bed of this disease, whence infection has spread over the whole world. In the report of the commissioners of the United States Board of Health, sent to Cuba in 1879, it is stated that during the preceding thirty-three years but one month passed without cases of yellow fever being reported. And such is the condition found there to-day. The results of our recent war, however, have practically placed the United States in charge of the majority of the islands in the West Indian group. And among the first and greatest tasks our Government has to perform is a sanitary revolution in these islands. Perhaps no better opportunity to prove the true advance of the science of medicine could be offered than this condition presents. The medical profession, then, should take a lively interest in the question, for if the West Indies can be cleansed of their infectious filth, not only will they present a tropical paradise for our merchants and citizens, but the epidemics of yellow fever and other Southern infectious diseases will become almost a matter of history in our country.

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THE JOURNAL, and with it the entire Medical School, extends a most hearty welcome to our new Professor of Physiology, Mr. B. Moore. Professor Moore entered Queen's College, Belfast, in 1890. He studied general science there for four years, graduating with Honors in '93, and obtaining in '94 the M.A. degree

with first place and a University scholarship of £300 in Experimental Science. Later he was granted a science scholarship by Her Majesty's Commissioners of the Exhibition of 1851, and proceeded to Leipzig University, where he studied Chemistry under Ostwald and Physiology under Ludwig and von Frey. Afterward he commenced research work in Physiology with Schäfer at University College, London. He was appointed Sharpey Research Scholar, and in 1897 was advanced by the College Council to the position of Assistant Professor. Professor Moore has published various scientific papers in the *British Journal of Physiology* and the Proceedings of the Royal Society. Aside from these he has written the article on the chemistry of digestion and absorption in Schäfer's text-book of physiology and an elementary text-book of physiology at present in press. The school is to be congratulated on securing the services of a man of such wide reputation, and his connection with the school cannot fail to add to our standing both at home and abroad.

* * *

ASIDE from the resignation of Professor Lusk and the coming of Professor Moore to fill his place, several important changes have been made in the Medical Faculty for the ensuing year. Dr. Henry P. Stearns, after a quarter of a century of uninterrupted work as Lecturer on Insanity, has resigned, and Dr. A. R. Defendorf, class of '94, M. S., has been appointed in his stead. Dr. Charles A. Lindsley (Professor of the Theory and Practice of Medicine, Emeritus), is taking Prof. William H. Brewer's place in lecturing on Sanitary Science. Dr. E. H. Arnold, formerly clinical assistant in Orthopædic Surgery, has been appointed instructor in Orthopædic Surgery. Dr. Charles D. Phelps, formerly assistant in Physical Diagnosis, becomes instructor in the same branch; and Dr. R. E. Peck, formerly assistant in the medical clinic, is made instructor in Neurology.

* * *

THE curriculum for the college year just opening is of special interest, as the present Senior Class is the first one to take the fourth year work. It may be found in detail in another column. An inspection shows at once the general plan on which it is constructed. The first and second years are devoted to a thorough grounding of the student in the fundamental branches, chemistry, physiology, anatomy, materia medica and pathology. During these two years the instruction is chiefly given in the class rooms and laboratories, the laboratory work being a notice-

able feature of this part of the course. The work of this period is obviously arranged with a view to train the student to work and think according to the methods of science, as well as to the acquisition of facts. In the third year the more strictly professional branches are taken up, the time being devoted largely to class room work in pathology, medicine, surgery, obstetrics and pharmacology. The laboratory methods of teaching are still followed in pathology and in the section work in physical diagnosis, in bandaging, and with the obstetrical manikin. Clinical work is begun also in this year in the general medical and surgical clinics. It is particularly in the fourth year that the changes from the old curriculum and the advantages of the new are seen. The instruction in the specialties and the personal clinical instruction which had formerly to be given to students in the third year form the basis of the work of this year. The general plan of the year is to group the class room instruction in the first term, during which time the students are also attending general clinics in the subjects taught. In the second and third terms didactic instruction is almost wholly suspended, and the time is devoted to personal clinical instruction and practical clinical work in the whole range of the subjects previously taught. The addition of one year to the course has made a great improvement in the curriculum, not only in the introduction of new subjects of study, but in the more thorough grading of the studies.

MEDICAL SOCIETY REPORTS.

FAIRFIELD COUNTY MEDICAL ASSOCIATION.—The semi-annual meeting of the Fairfield County Medical Association was held at Hobbie's Grand Army Hall, Stamford, Conn., on Tuesday, October 11, 10 a. m. Dr. J. C. Lynch presided. There were about thirty-five members present, mostly from Bridgeport and Stamford.

Dr. Watson E. Rice, the Vice President of the Society, made the address of the day. In it he made a strong plea for a better study of the best drug and the best dosage for each locality. He said that each individual physician must prove, by his own observations, what is the most suitable drug and what the most suitable dose for use in his practice among his own people. The blind following of any leader, however great, in the application of remedies, is but another case of the blind leading the blind. It is interesting in these days of numerous medical journals to note the marked difference in dosage of the same disease in different localities, and they may all be right.

Dr. Rice's paper was discussed by Drs. Barber, Donaldson, Shеды and Bronson.

The following new members were then elected: Drs. H. E. Smyth, H. R. Bennett and J. M. Johnson, all of Bridgeport; Dr. Munson of Stamford and Dr. J. W. Gordon of Sandy Hook.

Dr. Frank M. Tiffany of Stamford then read an excellent paper on "The Prognosis and Treatment of Common Colds," which was discussed at some length by Drs. Sheedy, Donaldson, Barber, Phillip, Rogers, Lynch, et al.

Dr. Tiffany spoke in substance as follows:

The prognosis of common colds is guardedly favorable. The element of uncertainty is introduced by the various degrees of severity of colds and by the various sequellæ to which they predispose. The form known as the grippe cold is especially liable to be followed by pneumonia, while the common "cold in the head," if treated at all, is less likely to terminate in a more serious affection. The swollen and inflamed mucous membranes of the throat and air passages, with here and there an abraded surface from coughing, offer the most favorable point of entry for pathogenic bacteria, which they only too often make use of, to the discomfiture of the patient. The ubiquitous tubercle bacillus finds his best mark in the air passages congested and

abraded by cough, and in the system already debilitated by grippe. Different people react differently to a cold. In one it affects the head and nose almost entirely, another shows pharyngitis, tonsillitis and laryngitis; your next patient may have nearly a pure bronchitis, while others show cystitis, nephritis, etc. The family physician or the patient himself often learns just what to expect when a cold is contracted. There is no specific for colds. The treatment is varied, and nearly every physician has his own favorite remedies, yet a few points are common to nearly all. We recommend freedom from exposure to cold or irritating vapors, a room of even temperature, a hot foot bath, and that the patient should, if possible, go to bed. The diet should be light and nutritious, and a purge is to be advised. A cleansing alkaline wash for the nose and throat is generally employed and often followed by a spray of menthol and alboline, or two per cent. cocaine. If a more severe cold settles in the larynx and bronchi we often apply mustard or capsicum plasters, rub with camphorated oil and protect by a suitable jacket. The steam atomizer with a little carbolic acid is good. Internally, after the purge, a diaphoretic draught is often useful, followed by a sedative like phenacetin, Dover's powder, codein, etc. For other remedies, aconite, camphor, belladonna, quinine, whiskey, et al., may find their appropriate uses in the different forms and stages of a cold.

Dr. Joseph Collins of New York read a most admirable paper on "Headaches and Their Treatment." Dr. Collins made use of several charts of the brain whereon he localized the seat of several of the common forms of headache.

The society then lunched at the Suburban Club.

At the afternoon session Dr. A. M. Ewing, Professor of Pathology and Dermatology at the Niagara University at Buffalo, read a paper upon "Common Forms of Skin Diseases and Their Treatment."

Dr. W. H. Donaldson read a paper on Whooping Cough, in which he advocated hanging about the room in which the child was confined, towels saturated in a solution of formaldehyde.

MIDDLESEX COUNTY MEDICAL ASSOCIATION.—The semi-annual meeting of the Middlesex County Medical Association was held September 7, 1898, at the Cooley House, Westbrook, on the invitation of Drs. T. B. Bloomfield and F. S. Cowles. The meeting was called to order by the President, Dr. John E. Loveland of Middletown.

Drs. Hazen, Sears and Keniston were appointed a committee on credentials.

The subject for discussion, "The Power of the Mind over Disease," was opened by Dr. S. W. Turner of Chester. He recounted his personal experience in the operation of mental influence and read a brief paper on the subject of hypnotism. Dr. C. A. Sears of Portland, the second leader in the discussion, continued his personal experience on the subject, dwelling especially upon the effects of mental influence as seen in the domain of obstetrics.

Remarks by Drs. F. S. Smith, J. M. Keniston, F. S. Cowles, A. J. Campbell, M. C. Hazen, G. N. Lawson, L. Maitland and F. K. Hallock concluded the discussion.

Dr. T. B. Bloomfield of Westbrook exhibited the case of a child with a peculiar unilateral skin affection of hysteric formation. This case gave rise to a general discussion on the subject of "maternal impressions."

Dr. James M. Keniston of Middletown contributed the only voluntary paper of the meeting, entitled "Pyoktanin and its Use." The president appointed Drs. Smith, Plumstead and Lawson as committee on discussion for the next semi-annual. This committee, after conference, reported that the subject for discussion would be "The Treatment of Malaria."

LITCHFIELD COUNTY MEDICAL ASSOCIATION.—The semi-annual meeting of the Litchfield County Medical Association was held at Litchfield, October 11. There were present nine members besides the President and the Clerk. Drs. E. K. Loveland of Watertown, S. H. Wadhams of Torrington and C. S. Warner of Litchfield were admitted to membership. Dr. W. M. S. Curtiss was appointed delegate to New Haven County.

The general discussion pertained to subjects suggested by the general topics. Gastro-enteritis of young children and especially to feeding and the care of the mouth. The treatment of milk and the inspection of milk by the agents of the State Board of Health received a full share of attention. Dr. Elias Pratt related the crowning success of his efforts in a Torrington dairy to secure a high grade of milk from a stable managed on correct principles, that is afterwards guarded from every source of contamination in carting, storing and marketing. The scheme is successful as to popularity with consumers and profits to the producers.

The next meeting will be held at Winsted, January 15.

NEW HAVEN MEDICAL SOCIETY.—A regular meeting of the New Haven Medical Society was held at its rooms, on Chapel street, October 5, 1898. Dr. Connor, the Vice President, presided in the absence of President Townsend. Dr. McDonnell read a paper entitled, "Skin Eruptions of Malarial Origin."

Election of members then took place. Dr. Kirby, Dr. Springer and Dr. Graniss were elected. The library committee reported that it had made arrangements whereby members of the society might take journals and books from the library. The meeting then adjourned.

The Usual Semi-Monthly Meeting of the New Haven Medical Society was held Wednesday evening, October 19, 1898, President Townsend presiding.

Dr. Fleischner spoke of the therapeutic uses of the sozoiodolates. He said they were a class of salts, which could be used extensively as an antiseptic, disinfectant, and parasiticide. He had used four salts, the mercuric, potassium, zinc and sodium salts, but his use of them was limited owing to the difficulty of obtaining them. He had used the mercuric salt in syphilis with good results, and the zinc and sodium salts in gonorrhœa, finding it much better than the old treatment with zinc sulphate and with ~~thallin~~ ^{thallin} sulphate and thought that in chronic cases of gonorrhœa the sodium iodolate was of especial value in curing the morning drop. He said he felt that this class of drugs was worthy of more extensive use.

Dr. Hawkes related a case of a man who on August 1, struck a trolley pole, while riding on the rear of the car, producing a fracture. He was brought to the hospital, and was found to have oozing of brain matter from the wound, and bleeding from the ears. He was conscious at first, but later apathetic. The next day he began to show a temperature and a diagnosis of fracture extending from the base of the skull through the parietal and temporal was made. He began to have twitchings of the left side of his face and of his arm and leg, of an eclamptic nature, and he was also paralyzed on left side during intervals between convulsions. A consultation was held but it was not decided to operate. On August 3, the conditions became aggravated and his pulse became weak. Convulsions of his arm lasted an hour. He was operated upon that afternoon and a fracture was found following the fissure of Rolando, a clot of blood was removed and there was found some destruction of brain matter, so that a depression remained. Patient had a very bad night after the operation, having convulsions and a temperature. He was better the next day, however. He

continued to improve and in four or five weeks left the hospital. A week after he had a convulsion, but was put where it was quiet and has had only one or two since, and has gradually regained his powers. The case is of interest in that it shows from how severe an operation a person can recover, and especially when the operation was performed as a last resort.

Dr. Daggett reported a case of articular rheumatism of a man thirty-three years of age. Patient had a slight attack, yet got up and took dinner, but while doing so felt faint. He lay down for a while, took some stimulants and feeling better continued his meal. After dinner his pulse got weak, and he became unconscious. Dr. Daggett was called in consultation with the attending physician and found the patient cyanotic and weak, with barely a perceptible pulse. He was treated with strychnine and nitro-glycerine, but without avail. Patient died at 5.30 p. m. No murmur had been noticed. The peculiar thing is the serious ending of so slight an attack of articular rheumatism.

Dr. Arnold opened the discussion on Anaemia, the etiology, varieties and treatment. After it was discussed by Dr. Fleischer, Dr. Hawkes, Dr. Townsend and others the meeting adjourned. The question committee reported that Dr. Swain had been invited to read before the society at its next meeting a paper which he recently read before the New York Medical Society on "Acute Frontal Sinusitis."

MEDICAL PROGRESS.

THE RÔLE OF THE MOSQUITO IN THE EVOLUTION OF THE MALARIAL PARASITE.—Dr. Patrick Manson (*Lancet*, August 20, 1898). At a recent meeting of the British Medical Association in Edinburgh, Dr. Manson gave a lecture on, and exposition of, the work done lately by Surgeon-Major Ronald Ross in Calcutta, India, in trying to determine the part played by mosquitoes in malarial infection. From previous experiments Ross had demonstrated that flagellate bodies were formed in the infected blood in mosquitoes' stomachs, and so pretty conclusively established the fact that the parasite here enters a new stage of existence. Partial success only crowned his efforts to study its further development, and so he finally decided to prove a cycle of infection through the mosquito by some other parasite than the plasmodium. He chose for that purpose two intra-corporeal parasites of birds—proteosoma and halteridium. Grey

mosquitoes were allowed to feed on birds infected with these, and the results carefully watched. The proteosoma alone gave any results. Dissection of the mosquito showed that the parasite, after reaching the stomach wall, increased rapidly in size till it projected beyond the stomach walls into the body-cavity. After a time this so-called proteosoma-coccidia burst, and what Ross styles "germinal vernicules" were set free in the body, blood and tissues of the mosquito. The next link in the chain of evidence was the discovery of these vermicules in the venemosalivary glands of the mosquito. To complete the cycle Ross allowed mosquitoes infected with proteosoma to feed on healthy birds, and found that the blood of these was, in a few days, charged with the parasite. Thus the analogy between bird and human infection has only to be proved to establish that the mosquito is a carrier of malaria and an infector of man.

NOTES ON THE THERAPEUTIC USES OF THE SUPRA-RENAL GLAND.
—(*Medical Record*, Oct. 8.) Dr. Bates of New York has used a one per cent. solution in ophthalmic practice with excellent results. When this is instilled into the eye the conjunctiva of the globe and lids whiten in from forty seconds to two minutes. It has no effect on the pupil and no antiseptic or anæsthetic properties. Its action is purely astringent. The extract will whiten the granulations found in suppurative otitis. In dry catarrh the extract is often valuable to relieve congestion. Cases of deafness depending on congestion or inflammation are relieved where other remedies fail. Tinnitus is sometimes permanently cured. The extract will lessen the congestion of the turbinated bodies immediately and will open the nose after other remedies have failed. Closure of the nasal duct due to swelling of the lining membrane can be opened by syringing the extract into the punctum. This successful employment in nasal stricture would suggest its use in strictures of the urethra, œsophagus, pylorus, etc. When applied to the skin it produces immediate blanching even when the cuticle is unbroken. It has been used in burns to prevent vesication, to whiten eczematous patches, and in smallpox to prevent vesiculation and its consequent disfigurement. For strengthening the heart and raising the blood pressure supra-renal extract offers a remedy more powerful than digitalis or ergot.

To recapitulate: as a pure astringent in all inflammations, as a hæmostatic, and as a heart stimulant, no therapeutic agent has been employed which can compare with the extract of the supra-renal gland.

NEW BACILLI RESEMBLING THOSE OF TUBERCULOSIS.—(*Deutsch med. Woch.*, No. 24.) Moeller reports the finding of a new bacillus on timothy and other grass and in the feces of cows, horses and other animals. These animals were tested by the tuberculin test and found to be free from tuberculosis. The bacilli resemble Koch's bacillus in size, shape and their resistance to acids and alcohol, but differ in several respects, especially in their rapidity of growth on different media. Inoculations with pure cultures gave interesting results. In guinea pigs there was infiltration with caseation at the seat of inoculation; the lymph glands were enlarged; there was an exudate in the pleural cavity; nodules, grayish white and yellowish, were found in mesentery and peritoneum, also in the spleen, which was much swollen, and in the liver. The lungs showed cavities and numerous nodules and in the cavities and nodules large numbers of bacilli were found. Cats, rats, pigeons and hens were immune. The changes were like those of experimental tuberculosis, but the cavities more closely resembled human tubercular cavities than is usually the case in experimental tuberculosis. Histologically, also, there was much resemblance. Giant cells, however, were rare and did not contain peripheral nuclei. Further investigations are now in progress and are awaited with much interest.

CATHETERS AND CYSTITIS.—(*N. Y. Med. Journal*, Sept. 3.) Dr. R. N. Mayfield presents a new catheter which he claims does away with many of the objections attending the use of the ordinary style of this instrument. In this instrument the danger of clogging or failure to perform its functions is obviated, and its interior may be easily made aseptic, and bits of mucus that usually clog an ordinary catheter may be readily drawn off. The catheter is tubular with a curve like the ordinary instrument and opened at the end for an inlet. For the closure of the open end and for the easy introduction of the catheter, a bulbous or rounded head is used attached to one end of a wire passing through the body of the tube and projecting at its rear or outlet end. This construction forms a catheter having an area of opening so large as to greatly obviate the danger of clogging, for, if mucus should lodge against the open end, the working of the head back and forth upon its seat would cut away the obstructing bits of mucus and permit them to pass through the tube. Regarding the treatment of cystitis with the employment of this catheter, presuming that we have a typical case, with ropy, viscid and tenacious mucus, the membrane thickened and possibly ulcerated, we begin the treatment as

follows: 1. Inject cocaine gr. $\frac{1}{4}$ in a drachm of water into the membranous portion of the urethra. 2. Anoint the largest hard-rubber catheter that can well be passed and increase the size one number each week until the urethra is normal in size. 3. Begin with dilute hydrogen solution—preferably hydrozone (1:20), using the solution freely and repeating until the return flow is clear and not foaming. 4. Partly fill the bladder with the following solution: tincture of iodine compound, two drachms; chlorate of potash, half a drachm; chloride of sodium, two drachms; warm water, eight ounces. Let it remain a minute or so and then remove. This treatment should be used once or twice a day. Where extensive ulceration is expected, Dr. Mayfield recommends, once a week, the use of from ten to twenty grains of nitrate of silver to the ounce and neutralize with chloride of sodium solutions. This treatment if carried out carefully will be satisfactory, as there is no remedy that will destroy bacteria, foetid mucus or sacculated calcareous deposits like hydrogen.

NOTES ON SURGERY IN THE RECENT WAR.—(*Medical News*, Oct. 15.) Dr. Bell, of the 71st New York, in a paper before the New York Academy of Medicine, tells of his experience in the Cuban war. He remarks on the great variety of wounds received. Men shot through the abdomen by the Mauser bullet were known to have walked four and five miles to the hospital and arrived there in good condition, and to have recovered without the necessity of resorting to an operation. He recounts several instances of men shot through the liver and kidney and yet suffering but little inconvenience and showing no bad results. The Mauser bullet, however, at short range is apt to be explosive in its action, especially when a viscus, as the brain, or a joint were penetrated. At a greater range than 200 yards the Mauser penetrated with but a small wound of entrance and a slightly larger wound of exit, and both decreased in size as the firing distance was lengthened. If beyond this distance bone was injured, there was always some comminution and the wound of exit was a trifle larger, due to laceration of soft parts from splinters of bone. There were numerous instances of a bullet passing through the shaft of a long bone with a clean perforation. In several cases Mauser bullets passed through the skull and out again with no apparent injury to the brain, and the patients reported for duty again in a few days with the wound entirely healed. There were but few amputations and these were performed only when a main artery had been severed or a limb

mangled with shrapnel. The simplest antiseptics were found to act best in such cases, and iodoform was almost entirely abandoned, owing to the fact that its use in the tropics caused irritation of the skin and that it was too readily absorbed from exposed surfaces. In dressing small wounds collodion was much used. Laparotomies were performed in several cases and were uniformly fatal. Nearly every officer and man in the regular service was provided with a first-aid packet, which proved of great value in rendering first aid to the injured. The volunteers were not well equipped with these, nor did they appreciate their value. The dressing stations near the firing line were devoted entirely to the application of temporary dressings, the arrest of hemorrhage and setting of fractures. Several bad compound fractures of the thigh were received at the field hospitals. These were dressed under the most careful antiseptic precautions and put up in plaster of paris and transported to the United States. The number of killed during the campaign is estimated at about 280 and wounded about 1,400. But a small proportion of those wounded, 65 in all, died of their wounds, and but a small number have required much care since their return to the United States.

HOSPITAL AND CLINIC NOTES, ETC.

ATRESIA OF EXTERNAL OS COMPLICATING LABOR.—The patient had always been healthy. Menses regular. Age twenty-four, and married four years. Had never been pregnant before. There was no history of cervical catarrh.

August 11 the patient began to have pains at 7 a. m. By afternoon the pains had become hard and regular. The patient was visited 9.30 p. m. An examination revealed the head of the child low down in the pelvis, pressing firmly against the walls of the lower segment of the uterus.

Careful and prolonged search with the finger did not discover the external os. Expecting the cervix would dilate in a few hours, the physician left the patient and did not see her again until 3.30 the next morning. The pains were now of an expulsive character. Another examination revealed no dilatation of the cervix nor sign of external os. Each pain brought the head low down toward the vaginal outlet.

All the time there had been a trickling of the amniotic fluid. Chloroform was administered and a careful examination with

good light was made by means of a speculum. There was a clear view of the vaginal portion of the uterus, and yet, with the most careful search, no opening could be found. After a consultation, an artificial opening in the uterus was considered as probably necessary. The patient was removed to the S. R. Smith Infirmary, Staten Island, two miles distant. During conveyance there chloroform was given to check the pains.

The examination on the table this time revealed a small amount of fluid trickling from the uterus, and on placing the finger firmly over the spot the parts at once separated—the os dilating rapidly. At no time could the finger detect any dimpling where the os should be.

Forceps were used, and in an hour the child was born in a moribund condition, dying in a short time.

In a practice of twenty-one years this was the first case of just this kind that the attendant had ever seen. With the vigorous pains the parent was having there seemed to be imminent danger of rupture of the uterus.

HEAT STROKE.—At 5 p. m. September 3, S. S. an Italian laborer, age 45, was admitted to the New Haven Hospital, with a history of having been at work previously for several hours in a very hot room. Once or twice during that time he was seen to put his hand to his head, and at 4.15 o'clock he was seen to fall to the floor. History previous to this could not be obtained. Examination on entrance showed that the patient was unconscious and could not be roused. The pupils were dilated, breathing superficial and slow (8 per minute), pulse weak and rapid (120). The rectal temperature was 109.9°. This was taken twice with different thermometers. He was immediately placed in an iced alcohol tub bath and allowed to remain until the temperature had fallen to 100.8°. This took thirty-five minutes.

After removal from the bath his temperature continued to fall until 95° was registered. His respirations were eight to the minute, but radial pulse could not be felt. Friction, heat and mustard over heart were employed, and hyperdermic injections of strychnine, atropin, digitalis, and whiskey were at once administered. Hot coffee enemas were given.

He rallied and became delirious. His temperature again started up and in four hours had reached 107°. He was again placed in the iced alcohol bath, and his temperature again fell. When it had reached 100.8° he was removed, having been in the tub twenty minutes.

The patient again went into collapse and he was treated as after the first bath. He responded to stimulation and at the end of eight hours had recovered consciousness. His pulse was now 110°, respiration 20, and temperature 101.2°. In four days his temperature was normal and on September 9 he was discharged cured.

ITEMS OF INTEREST.

The arrangements at Cornell University are now such that students are allowed to obtain their B.A. and M.D. degrees in six years, the whole preliminary training in the subjects not especially relating to the practice of medicine and surgery being counted toward the B.A. degree.

The outbreak of bubonic plague at Vienna, due to the experiments in the cultivation of the bacillus in Professor Nothnagle's bacteriological laboratory, has spread terror at the Austrian capital. Five cases in addition to that of the late Herr Barisch, who contracted the plague while assisting in the cultivation of the bacillus, have occurred. The disease has assumed a pneumonic form. There are no boils, but each case is accompanied by high fever and blood splitting.

Questions given by the committee of the Connecticut Medical Society at the examinations for license to practice, held at the City Hall, New Haven, Conn., July 21 and 22, 1898. The candidates were instructed to choose eight out of the ten questions appearing on each paper and to ignore the other two.

ANATOMY.

1. Describe the intracartilaginous ossification.
2. Describe a typical lumbar vertebra.
3. Briefly describe the lower jaw (a) at birth, (b) at about two years of age, (c) in the adult, (d) in old age.
4. Describe the cotyloid ligament of the hip.
5. Name the muscles of the anterior humeral region and give the origin and insertion of each.
6. Describe the groups of superficial inguinal lymphatic glands and give the origin of the lymph entering each group.
7. Name the three great divisions of the fifth nerve and give the distribution of the branches of the second division.
8. Name the ossicles of the tympanum and give the relations of each to the others and to neighboring structures.
9. Describe the arterial circulation of the hand.
10. Name the bones of the foot and designate their relations to each other.

SURGERY.

1. State the histological changes which take place in a recent fracture after complete coaptation.
2. Give the differential diagnosis between septicæmia and pyæmia.
3. Give the diagnosis and treatment of surgical tuberculosis of joints.
4. Describe the development, both gross and microscopical, of Paget's disease of the nipple.
5. State the chief differences between chancre, chancroid, and herpes of the genitals.
6. Give the pathology, symptomatology and mode of reduction by manipulation of subcoracoid dislocation of the head of the humerus.
7. How would you treat a compound comminuted fracture of the tibia and fibula if the arteries were not badly lacerated?
8. Describe either Syme's or Pirogoff's amputation at the ankle and state wherein the other operation differs.
9. Give the diagnosis of hydrocele and describe two procedures for its cure.
10. Describe ligation of the femoral artery in Scarpa's triangle.

CHEMISTRY AND HYGIENE.

1. What are the chemical formulæ for ammonium chloride, sulphuric acid and zinc sulphate?
2. How would you determine the quantity of urea in urine?
3. Name and describe the various casts found in urine.
4. Given a sample of gastric juice how would you test its powers to digest meat, eggs and milk?
5. Name the chemical elements found in the human body.
6. Name the diseases known to be due to micro-organisms.
7. How would you limit the spread of the three most fatal of the diseases known to be due to micro-organisms?
8. Give a table of the differential diagnosis of smallpox, measles and chicken pox.
9. What are the most characteristic early symptoms and signs of yellow fever?
10. How would you disinfect a room and its contents after a case of yellow fever?

PHYSIOLOGY.

1. What are the elementary tissues of the body; of what are these tissues composed?
2. What influences accelerate the coagulation of the blood; what influences retard it?
3. What is a proteid and what are its distinguishing characteristics?
4. What is the effect upon the heart of stimulating the vagi nerves, and what the effect of section of these nerves?
5. What changes take place in the blood as the result of respiration, both in the lungs and in the tissues?
6. How do you classify food stuffs; give examples, the different kinds and the predominant chemical elements, and what is their action?
7. With what digestive ferments does the food meet in passing through the alimentary canal and what is their action?
8. What is the use of lymph?
9. What things are necessary for the manifestation of a reflex action?
10. What are the sources of urea in the urine?

OBSTETRICS.

1. Describe the changes which take place in the uterus after impregnation.
2. What varieties of deformed pelvis interfere with normal labor?
3. Give the objective and subjective signs of pregnancy and state their relative value.
4. How would you prevent Puerperal Sepsis and how do you treat it?
5. How would you diagnose a transverse presentation, and how would you manage it?
6. State the dangers and symptoms of a prolonged labor, under what condition would you interfere, and what would you do if interference becomes necessary?
7. What are the causes, symptoms and treatment of rupture of the uterus?
8. In case a mother is unable to nurse her new born babe, what directions would you give for feeding the child? Give items in detail.
9. What advantages does Laparo-elytrotomy possess over other operations, and tell how it differs from them and how it is performed?
10. What conditions must prevail before forceps can be applied and what dangers must be guarded against in their use?

PRACTICE AND DIAGNOSIS.

1. Make a differential diagnosis between hydrothorax (including empyema) and emphysema.
2. What reflexes are tested in the diagnosis of nervous affections; how do they vary from normal and what do they indicate?
3. Name the different varieties of casts found in renal disease; what do they indicate, and what is the condition of the urine, quantitatively and qualitatively in each case?
4. What are the causes, symptoms and pathology of acute general Peritonitis?
5. What are the symptoms and pathology of acute infantile paralysis (Poliomyelitis anterior)?
6. Differentiate between tonic and clonic spasms and under what circumstances may they occur?
7. Give the symptoms of Diabetes Mellitus.
8. Name the causes of Hematuria.
9. Describe the group of symptoms which occur under the name of Exophthalmic Goitre.
10. What is the etiology and pathology of interstitial Pneumonia?

MATERIA MEDICA AND THERAPEUTICS.

1. Give the physiological action of cocaine upon the circulatory, respiratory and nervous system; also the local effects.
2. Name five cerebral excitants and explain their mode of action.
3. Name four vermifuges, their origin, preparation used and reasons for using.
4. What is Hydrocyanic acid? give its physiological action, antidotes and use in medicine.
5. What drugs would you use to diminish blood pressure in the head, and how do they produce their effect?
6. Name several drugs used to prevent nausea, and state how they act in accomplishing their purpose.

7. How would you treat a case of non-traumatic cerebral, or meningeal hemorrhage, and how the sequelæ?
8. Compare the effects of K. I. and Hg. upon the blood in the therapeutics of syphilis.
9. How would you treat a case of infantile eclampsia, taking into account the various causes?
10. Write a prescription in Latin, unabbreviated, containing four ingredients to be used in a cough for a child two years old, suffering from pneumonia and give the reason for their use.

OBITUARY.

1846.—Andrew Judson White died in London, England, September 23, after a protracted illness. He was born at Canterbury, Conn., May 29, 1824. He entered Yale College with the class of '46, but soon took up the course in the Medical School instead, and graduated in 1846. He was for many years engaged in the wholesale drug business in New York City and in London, although of late years not actively. He was for many years president of the Yost Typewriting Company, until it, with others, became merged into the Union Typewriter Company, in which he was a director at the time of his death. In 1894 he presented Yale with a dormitory, which is named after him. His remains were brought home and interred at Woodlawn, October 23.

1853.—The death of Dr. Joseph B. Elliott occurred on Sunday, July 3, at his home, 493 Clinton avenue, Brooklyn. Dr. Elliott was born in Sharon, Conn., in 1821, and was a descendant of John Elliott, the famous Indian Missionary. After graduating from the Yale Medical School in 1853, he took charge of the State Insane Asylum at Trenton, N. J. A few years later he removed to Brooklyn, where he continued in active practice almost to the close of his life. Dr. Elliott was consulting physician to the Homeopathic Hospital and Brooklyn Nursery. He was also warden of the Episcopal Church of the Messiah. His remains were interred at Sharon.

1863.—The death of Charles Samuel Ward occurred in Bridgeport, July 31, from cerebral hemorrhage. Dr. Ward was born in 1842 and graduated from the Yale Medical School in 1863. The same year he began his career as a Medical Cadet, and served through the war in that capacity. After the war he began to practice in New York City. Since his retirement from practice he has passed the greater part of his life in Bridgeport.

He was the National Secretary of the Society of Colonial Wars and was active in the organization of the society called the Barons of Runnymede.

1900.—Henry E. McDermott died suddenly of heart failure in this city Monday afternoon, October 4. Mr. McDermott underwent a severe operation for appendicitis last spring and never fully recovered from the effects of the operation. He was born on November 27, 1873, in St. Johns, N. B., but for the last thirteen years had resided in New Haven. He prepared for college at the Hillhouse High School, and graduated from Yale College in 1896, with the highest honors. He spent the following year in graduate study and occupied the position of Assistant to Prof. Chittenden in the Sheffield laboratories. He entered the Medical School in 1897, where he again showed his ability as a thorough student. During the year he received an appointment as Laboratory Assistant in Physiological Chemistry at Columbia University, N. Y. He began his work at Columbia early in September, but his health soon broke down and he was obliged to resign. He was also a member of the Connecticut Naval Reserve at the time of his death. The funeral was held Thursday, October 8, from the Dwight Place Church, of which he was a member.

ALUMNI AND SCHOOL NOTES.

Drs. Swain, Osborne, Elliott and Tuttle read papers before the meeting of the New York State Medical Society held in New York City, Wednesday afternoon, October 19.

'75.—Prof. T. M. Prudden, whose article "Under the Spell of the Grand Cañon" appeared in *Harper's* for August, has been spending his vacation in studying the remains of the primitive peoples of this continent in the far West.

'88—Dr. L. B. Bishop has been appointed assistant in paediatrics.

'88—Captain Henry R. Stiles, assistant surgeon, U. S. A., will rejoin his proper station, Fort Preble.

'92—Dr. J. A. Hartwell is sick with typhoid fever in New York.

'92—Dr. E. S. Munson, surgeon in the U. S. Army, who had charge of the transports at Santiago, has recently been visiting his brother-in-law, Dr. L. W. Bacon. He is at present stationed in the Surgeon-General's office in Washington.

'93—Dr. Wm. C. Wurtemberg is coaching the Dartmouth University football team.

'93—Dr. A. K. Brennan is just recovering from a severe attack of typhoid fever at his home on Franklin street.

'94—Dr. S. P. Goodhart was married to Miss Wolfe of Macon, Ga., at the home of the bride, in the early part of October.

'94—Dr. W. F. Verdi has recently been appointed assistant demonstrator of anatomy in conjunction with Dr. F. H. Reilly, '97.

'95—Dr. C. J. Bartlett and Miss Genevieve B. Kinne, daughter of Mrs. J. B. Kinne, were married at the home of the bride, Ypsilanti, Mich., on July 6. They sailed immediately for Europe. Dr. Bartlett is pursuing the study of pathology at Leipsig. He intends returning, however, in time to resume his work in the winter term.

'96—Dr. C. W. Kellogg has begun his course of lectures on Surgical Anatomy and Physiology before the Connecticut Training School for Nurses at the New Haven Hospital. Dr. Kellogg has recently removed his office to 233 York street.

'96—Dr. A. R. Deffendorf has accepted the position of Pathologist at the Connecticut State Asylum, Middletown. His duties begin in January, 1899.

'96—Dr. S. H. Wadhams has been appointed Acting Assistant Surgeon in the United States Army. He was recently ordered to report for active duty at Ponce, Porto Rico.

'96—Dr. F. A. Reilly, who recently completed his term of service at the Paterson General Hospital, has opened an office in New Haven, at 312 Columbus avenue.

'96—Dr. J. S. Maher, who has been pursuing studies at Vienna, has gone to Berlin.

'97—Dr. F. H. Todd has just recovered from blood poisoning from an infected finger.

'97—Dr. T. F. Cohane has opened an office at 459 Congress avenue, New Haven.

'97—Dr. F. J. MaGuire has opened an office at the corner of Grand avenue and Franklin street, New Haven.

'97—Dr. A. J. Brocksieper has opened an office in New Britain, Conn.

'97—Dr. J. B. Griggs has opened an office in Farmington, Conn.

'97—Dr. Stanley Woodruff has opened an office in Derby, Conn.

'97—Dr. Briggs has been practicing in Asheville, N. C., during the summer, but is now back in his office at 237 York street and will resume his position at the eye clinic.

'97—Dr. A. E. Loveland has been appointed assistant physician in the McClean Hospital for the Insane, Waverly, Mass., which is a part of the Massachusetts General in Boston.

'98—Dr. A. H. Thomas is at present coaching the Williams football team.

'98—Dr. W. R. Munger is pursuing post-graduate studies in New York preparatory to taking hospital examinations.

'98—Dr. F. W. Hulseberg has passed the New York State examinations.

'98—Dr. Philip DuBois Bunting received the Campbell gold medal for the highest rank during the examinations of his course.

'98—Dr. C. B. Brainard and R. Hulburt are working with Dr. Elliott at the Vanderbilt clinic, New York City.

'98—Dr. J. J. Cohane has been assisting at the New Haven Hospital for several weeks.

'98—Drs. J. J. Guilshan, R. Hulbert, H. E. Hungerford, C. A. Rider and H. A. Tyler passed their Connecticut State examinations last July.

'98—Dr. Thos. B. Dowden, ex-'98, has been appointed Chief Surgeon of Battery D., First U. S. Artillery, now located at Camp Cleary, Neman, Ga. He has been in the Government service all summer.

'98—Dr. H. C. Rowland served during the late war as seaman on the U. S. S. Yankee, from April 28 until September 2.

'99—T. J. Bergin and E. D. Smith assisted at the New Haven Hospital for some weeks this summer.

'99—A. E. VonTobel, Dean Foster and J. L. Burnham did obstetrical work in the Dispensary during the summer.

'99—James Pullman substituted in the Hartford Hospital for six weeks during the summer.

'00—G. L. Bunnell has gone to the Cornell University Medical School in New York City.

'00—Frederick Coonley spent two weeks of his summer vacation substituting at Charity Hospital, Blackwell's Island.

'00—G. L. Buist who has been hospital sergeant in the Yale Battery, later in the hospital service at Camp Wickoff, has returned to college.

'00—Cyrus W. Field has held the post of Pharmacist during the summer on board the U. S. Monitor Nahant.

'00—E. F. Hamlin served on the U. S. Receiving Ship Minnesota as first bayman during the war.

'01—N. M. Sansone has been obliged to leave school on account of ill health.

It is gratifying to note that so many men of last year's Senior class have received hospital appointments. Eighteen appointments among thirty-one graduates is a record of which we may justly feel proud. The list of appointments is as follows: P. Du B. Bunting, Elizabeth Gen., Elizabeth, N. J. F. W. Hulsberg, Colored Hospital, New York City. A. H. Thomas, Paterson Gen., Paterson, N. J. F. T. Billings, Paterson Gen., Paterson, N. J. A. E. Cobb, Bridgeport City Hospital. R. M. English, Bridgeport City Hospital. W. E. Ray, Norwich Hospital. J. J. Cohane, Norwich Hospital. W. W. Markoe, Soldiers' Home, Noroton, Conn. T. S. McDermott, St. Vincent's, New York City. H. G. Watson, St. Mark's New York City. M. E. Sherwood, French Hospital, New York City. L. B. Porter, New Haven City Hospital. H. A. Tyler, Hartford City Hospital. F. P. Heery, New Haven City Hospital. F. J. Parker, Eye and Ear Hospital, New York City. J. L. Perkins, Elizabeth Gen. Hospital. F. W. Nolan, Charity Hospital, New York City.

CURRICULUM OF THE YALE MEDICAL SCHOOL.

N. B.—The number of hours given are hours per week.

FIRST YEAR.

ANATOMY.—*Class-room*, 3 hours throughout the year. *Laboratory*, 15 hours, second term.

HISTOLOGY AND EMBRYOLOGY.—*Class-room*, 1 hour first and second terms, 2 hours third term. *Laboratory*, 4 hours throughout the year.

PHYSIOLOGY.—*Class-room*, 2 hours throughout the year.

CHEMISTRY.—*General, Class-room*, 4 hours first term. *Organic, Class-room*, 2 hours second and third term, *Analytical, Class-room*, 1 hour first term. *Laboratory*, 12 hours first term, 6 hours half of second term. *Physiological, Class-room*, 2 hours second and third terms. *Laboratory*, 6 hours half of second term, 9 hours third term.

EXAMINATIONS.—(1) Anatomy (bones, joints, muscles). (2) Histology and Embryology. (3) Elementary Physiology. (4) General and Organic Chemistry. (Including a laboratory examination at the end of the first term.) (5) Physiological Chemistry.

SECOND YEAR.

ANATOMY.—*Class-room*, 3 hours throughout the year. *Laboratory*, 15 hours one term.

PHYSIOLOGY.—*Class-room*, 4 hours throughout the year.

MATERIA MEDICA AND PHARMACY.—*Laboratory*, 4 hours first term. *Class-room*, 2 hours second and third terms.

PATHOLOGY.—*Class-room*, 3 hours throughout the year. *Laboratory*, 4 hours throughout the year.

BACTERIOLOGY.—*Laboratory*, 6 hours half second term.

MEDICINE.—*Class-room*, 2 hours third term.

EXAMINATIONS.—(1) Anatomy (bloodvessels, lymphatics, nervous system, viscera and topographical anatomy). (2) Physiology. (3) Materia Medica and Pharmacy. (4) Pathology.

JUNIOR YEAR.

MEDICINE.—*Class-room*, 4 hours first and second terms, 2 hours third term. *Clinics*, 2 hours. *Physical Diagnosis*, 4 hours one term each section.

SURGERY.—*Class-room*, 3 hours throughout the year. *Clinics*, 4 hours. *Bandaging*, 1 hour second term. *Surgical Anatomy*, *Class-room*, 1 hour second term. *Otology*, *Class-room*, 1 hour second term.

PATHOLOGY.—*Laboratory*, 2 hours throughout the year.

OBSTETRICS.—*Class-room*, 2 hours throughout the year. *Demonstrations with manikin*, 1 hour third term.

GYNECOLOGY.—*Class-room*, 2 hours second term.

PHARMACOLOGY.—*Class-room*, 2 hours throughout the year.

EXAMINATIONS.—(1) Pharmacology. (2) Pathology. (3) Obstetrics and Gynecology. (4) Medicine. (5) Surgery (general principles).

SENIOR YEAR.

GENERAL SURGERY.—*Clinics* at the Dispensary, 2 hours throughout the year. *Section work as assistants* in one of the Dispensary clinics, 6 hours one term. *Ward classes and operations* at the Hospital, 3 hours throughout the year.

GENITO-URINARY SURGERY.—*Class-room*, 1 hour first term.

ORTHOPAEDIC SURGERY.—*Class-room*, 1 hour first term. *Clinics*, 1 hour second and third terms. *Section work*, 1 hour second and third term.

OPERATIVE SURGERY. *Class-room*, 2 hours first term. *Operations* on the cadaver, second term in sections.

OPHTHALMOLOGY.—*Class-room*, 1 hour first term. *Clinics*, 1 hour second and third terms. *Section work* throughout the year.

RHINOLOGY and LARYNGOLOGY.—*Class-room*, 2 hours first term. *Section work* second and third terms.

MEDICINE.—*Clinics*, 2 hours throughout the year. *Section work* in Dispensary and Hospital throughout the year. *Clinical Laboratory*, 4 hours first term.

DERMATOLOGY.—*Class-room*, 1 hour first term. *Clinics*, 1 hour first term, 2 hours second and third terms.

PAEDIATRICS.—*Class-room*, 1 hour first term. *Clinics*, 1 hour second and third terms. *Section work*, throughout the year.

NEUROLOGY.—*Clinics*, 1 hour throughout the year. *Section work* throughout the year.

INSANITY.—*Class-room*, 1 hour second term. *Clinics* at the State Hospital for Insane.

SANITARY SCIENCE.—*Class-room*, 1 hour first term.

MEDICAL JURISPRUDENCE.—*Class-room*, 1 hour first term.

THERAPEUTICS.—*Clinics*, 1 hour throughout the year.

OBSTETRICS and GYNECOLOGY.—*Operative work* on the manikin in sections first term. *Service in the obstetrical clinic* with reports of at least two cases. *Gynecological clinic*, 1 hour throughout the year.

EXAMINATIONS.—(1) Therapeutics. (2) Medicine (a) examination of cases, (b) short written examinations on dermatology, paediatrics, neurology, sanitary science and medical jurisprudence, insanity. (3) Surgery (a) special or regional surgery. (b) Otology, rhinology, laryngology, ophthalmology. (4) Thesis.

CATALOGUE OF THE YALE MEDICAL SCHOOL, 1898-'99.

SENIOR CLASS.

Thomas J. Bergin, B.A., New Haven, Conn., Yale University, 1896.	14 Daggett street.
John L. Burnham, B.A., New Haven, Conn., Yale University, 1896.	98 Dwight street.
William T. Cannon, New Haven, Conn.,	57 Liberty street.
Arthur H. Dundon, Bridgeport, Conn.,	Bridgeport.
Dean Foster, B.A., Medford, Okl. T., University of Kansas, 1896.	174 Winchester avenue.
Arshag Der Margosian, B.A., Harpoot, Turkey, Euphrates College, 1894.	
Timothy G. O'Connell, Bristol, Conn.,	West Haven.
James Pullman, B.A., Patchogue, N. Y., Wesleyan University, 1896.	41 High street.
Edward D. Smith, B.A., Peru, N. Y., Yale University, 1896.	123 York street.
Albert E. Von Tobel, B.A., Torrington, Conn., Yale University, 1896.	391 George street.

JUNIOR CLASS.

Edward F. Ashley, Ph.B., Waterbury, Conn., Yale University, 1897.	91 Lake place.
W. Edward Balmer, B.A., Whitinsville, Mass., Yale University, 1897.	150 St. John street.
John H. D. Budeau, Bridgeport, Conn.,	Bridgeport.
George L. Buist, Jr., B.A., Charleston, S. C., Yale University, 1896.	120 College street.
Russell S. Church, Bristol, R. I.,	1142 Chapel street.
Frederick Coonley, B.A., Port Richmond, N. Y., Yale University, 1896.	333 York street.
Cyrus W. Field, New York City,	1161 Chapel street.

William J. Flannery, New Britain, Conn.,	New Britain.
Nathan L. Griffin, New London, N. H.,	3 Sylvan avenue.
Edgar F. Hamlin, Plantsville, Conn.,	391 Crown street.
Charles W. Henze, New Haven, Conn.,	131 West street.
Thomas V. Hines, South Meriden, Conn.,	South Meriden.
John W. Ives, West Goshen, Conn.,	88 Park street.
William J. Maroney, Springfield, Mass.,	11½ Park street.
Herman C. Pitts, Bristol, R. I.,	91 West Divinity.
Charles O. Purinton, Ph.B., New Hartford, Conn.,	1142 Chapel street.
Yale University, 1897.	
James F. Quinn, New Haven, Conn.,	14 Anderson street.
Charles W. Snider, B.A., Hartford, Conn.,	1016 Chapel street.
Fiske University, 1896.	
Paul R. Stetson, New Haven, Conn.,	New Haven.
Frank W. Stevens, New Haven, Conn.,	121 York street.
Harold A. Tarbell, Bridgeport, Conn.,	1142 Chapel street.
Louis J. Thibault, Waterbury, Conn.,	528 Chapel street.
Robert G. Tracy, New Haven, Conn.,	216 Cedar street.
Wesley G. Vincent, B.A., Cottage City, Mass.,	532 Pierson.
Yale University, 1896.	
Noah S. Wadhams, Ph.B., New Haven, Conn.,	22 Prince street.
Yale University, 1897.	
John G. Williams, Branford, Conn.,	121 York street.
William H. Wright, Bridgeport, O.,	1016 Chapel street.

SECOND YEAR CLASS.

Irving E. Brainard, Bristol, Conn.,	504 B, Duncan Hall.
Noah A. Burr, B.A., Winchester Center, Conn.,	105 Park street.
Yale University, 1898.	
Harry Carter, South Manchester, Conn.,	1098 Chapel street.
John P. Colgan, New Haven, Conn.,	118 Ashmun street.
William J. Cooney, New Haven, Conn.,	107 Greene street.
Patrick V. Costello, New Haven, Conn.,	214 Franklin street.
Robert N. Fuller, New Haven, Conn.,	40 Kensington street.
Samuel Gurney, Bridgeport, Conn.,	3 Sylvan avenue.
Gould S. Higgins, Hanover, Conn.,	192 York street.
Edward C. Krause, New Haven, Conn.,	26 Ward street.
Hubert A. Lane, Ph.B., Russell, Pa.,	99 Howe street.
Yale University, 1897.	
Leon F. LaPierre, Norwich, Conn.,	404 Crown street.
Walter S. Lay, Westbrook, Conn.,	560 Winthrop avenue.
Arthur F. Lindley, Montclair, N. J.,	1161 Chapel street.
Howard D. Lockwood, Bridgeport, Conn.,	3 Sylvan avenue.
Joseph A. Loeb, New Haven, Conn.,	200 Franklin street.
Nelson A. Ludington, Jr., New Haven, Conn.,	238 Grand avenue.
Thomas F. Maher, New Haven, Conn.,	133 Nash street.
Frederic F. Maloney, Dundee, N. Y.,	57 West Divinity.
George A. May, Philadelphia, Pa.,	Yale Gymnasium.
Arthur S. McQueen, New Haven, Conn.,	11½ Park street.
James P. Morrill, Springfield, Mass.,	121 York street.
Walter L. Murray, New Haven, Conn.,	321 Cedar street.
Cyrus E. Pendleton, Hebron, Conn.,	1098 Chapel street.

Corydon M. Ryno, B.S., Benton Harbor, Mich., Rutgers College, 1898.	121 York street.
Fred. H. Schofield, Bridgeport, Conn.,	3 Sylvan avenue.
William Senger, B.A., Port Jervis, N. Y., Williams College, 1895.	381 Crown street.
George Streit, New Haven, Conn.,	South Quinnipiac st.
James B. Williams, Bridgeport, Conn.,	Bridgeport.

FIRST YEAR CLASS.

Henry E. Adams, Bloomfield, Conn.,	19 Sylvan avenue.
George W. Barrett, Buffalo, N. Y.,	91 Olive street.
Hagope H. Bayunderian, B.A., Sivas, Turkey, Anatolia College, 1895.	92 Webster street.
David Bercinsky, New Haven, Conn.,	28 Dow street.
Charles H. Boyle, New Haven, Conn.,	27 Hamilton street.
Edward S. Brackett, B.A., Hartford, Conn., Yale University, 1897.	143 York street.
William T. Bull, Ph.B., Newport, R. I., Yale University, 1888.	120 College street.
William G. Clopton, New York City,	1098 Chapel street.
Alfred Duke, New Haven, Conn.,	37 Townsend street.
James J. Dunleavy, New Haven, Conn.,	14 St. John street.
Alfred L. Ellis, B.S., Hartford, Conn., Trinity College, 1898.	1010 Chapel street.
Francis A. Emmet, New Britain, Conn.,	New Britain.
Frederick C. Ender, West Haven, Conn.,	282 Washington avenue.
Peter Gleason, East Bridgeport, Conn.,	296 Pembroke street.
Dennis L. Glynn, Winsted, Conn.,	99 Howe street.
James H. Haberin, Pawtucket, R. I.,	181 Meadow street.
Frederick W. Hamilton, Ballymoney, Ireland,	292 Congress avenue.
Winfred M. Hartshorn, B.A., New Haven, Conn., Yale University, 1898.	74 Howe street.
Herman R. Hessler, New Haven, Conn.,	898 State street.
William M. Higgins, Thompsonville, Conn.,	1090 Chapel street.
John G. Hugo, New Haven, Conn.,	1245 State street.
Robert B. Keane, Bridgeport, Conn.,	Bridgeport.
John E. Lane, B.A., Hadley, Mass., Yale University, 1894.	130 Howe street.
Treby W. Lyon, New London,	120 York street.
Joseph G. Mahoney, Shelton, Conn.,	Shelton.
Henry P. Munger, New Haven, Conn.,	54 Crown street.
John D. Moore, New Haven, Conn.,	223 Grand avenue.
Oran A. Moser, Waterbury, Conn.,	22 Johnson street.
Elbert A. Munsell, New Haven, Conn.,	178 Quinnipiac street.
John J. Pagter, New Haven, Conn.,	47 Prince street.
Frank E. Phillips, New Haven, Conn.,	130 Howe street.
James F. Rooney, Plainville, Conn.,	27 Sylvan avenue.
John F. Ryle, Stamford, Conn.,	19 Sylvan avenue.
Ralph H. Schneelock, New Haven, Conn.,	294 Elm street.
Adolph E. Seydel, New Haven, Conn.,	54 Frank street.
Albert H. Sharpe, New Haven, Conn.,	141 Dwight street.
Dwight N. Skinner, Rockville, Conn.,	27 Sylvan avenue.

Andrew C. Swenson, Waterbury, Conn.,	263 Crown street.
Francis W. Vaughan, New Haven, Conn.,	8 Prospect place.
Thomas Walsh, Jr., Middletown, Conn.,	155 Spring street.
Ellsworth G. Warner, Hamden, Conn.,	Hamden.
Alfred B. Wood, Hartford, Conn.,	Hartford.
Francis W. Wrinn, New Haven, Conn.,	76 Washington avenue.
Frank H. Young, Lynn, Mass.,	404 Crown street.

SUMMARY.

Seniors,	10
Juniors,	27
Second year,	29
First year,	44
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Total,	110

BOOK NOTICES.

Elements of Latin. For students of medicine and pharmacy. By George D. Crothers, A.M., M.D., formerly Professor of Latin and Greek, University of Omaha, and Hiram H. Bice, A.M., Instructor in Latin and Greek, Boys' High School, New York City. Published by The F. A. Davis Company, Philadelphia, New York, Chicago.

The International Medical Annual and Practitioner's Index, 1898. Published by E. B. Treat & Co., New York.

Modern Surgery—General and Operative. By John Chalmers Da Costa, M.D., Clinical Professor of Surgery, Jefferson Medical College, Philadelphia, etc. Price, cloth \$4.00. Half Morocco \$5.00 net. Published by W. B. Saunders, Philadelphia, Pa.

Operative Surgery of Saunders' Medical Hand-Atlases. By Dr. Otto Zuckerkandl, Private-docent in the University of Vienna. Edited by John Chalmers DaCosta, M.D. Price, \$3.00 net. Published by W. B. Saunders, Philadelphia, Pa.

An American Text-Book of Gynecology. Edited by J. M. Baldy, and containing contributions by many well-known authors. The book contains 341 illustrations in the text, and thirty-eight colored and half-tone plates. Price, cloth \$6.00, sheep or half morocco \$7.00. Published by W. B. Saunders, Philadelphia, Pa.

Syphilis and the Venereal Diseases, one of Saunders' Medical Hand Atlases. By Prof. Dr. Franz Mracek of Vienna. The volume contains a large number of finely colored plates. Names of drugs and technical terms have been made to conform to current English expressions. Edited by L. Bolton Bangs, M.D., Consulting Surgeon at St. Luke's Hospital and City Hospital, New York. Price \$3.50 net. Published by W. B. Saunders, Philadelphia, Pa.

The Surgical Complications and Sequels of Typhoid Fever. By William W. Keen, M.D., L.L.D., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia; Vice President of the College of Physicians of Philadelphia, etc. Based upon tables of 1,700 cases, compiled by the author and by Thomas S. Westcott, M.D., Instructor in Diseases of Children, University of Pennsylvania.

The book also contains a chapter on the Ocular Complications of Typhoid Fever by George E. de Schweinitz, A.M., M.D., Professor of Ophthalmology, Jefferson Medical College. Published by W. B. Saunders, Philadelphia, Pa.

The Retrospect of Practical Medicine and Surgery. A half yearly journal containing a retrospective view of every discovery and practical improvement in the medical sciences. Edited by James Braithwaite, M.D., Obstetric Physician and Surgeon to the Leeds General Infirmary, etc. Published by G. P. Putnam's Sons, New York.

The Principles and Practice of Medicine. A revised and enlarged edition, by William Osler, M.D., Fellow of the Royal Society, Professor of Medicine in the Johns Hopkins University, Professor of Clinical Medicine in the University of Pennsylvania, Philadelphia. Published by D. Appleton & Co., New York.

Atlas and Abstract of the Diseases of the Larynx, one of Saunders' Medical Hand-Atlases. By Dr. L. Grünwald, of Munich. Edited by Charles P. Grayson, M.D., Lecturer on Laryngology and Rhinology, in the University of Pennsylvania. There are numerous colored plates illustrating the different diseases of the larynx. Published by W. B. Saunders, Philadelphia, Pa.

Principles of Medicine. By Charles S. Mack, M.D., one of the Professors of Materia Medica and Therapeutics in the Hahnemann Medical College and Hospital, Chicago. W. T. Keener Company, Chicago.

A Clinical Text-Book of Medical Diagnosis, for Physicians and Students, based on the most recent methods of examination. By Oswald Vierordt, M. D., Professor of Medicine at the University of Heidelberg, etc., translated, edited and enlarged by Francis H. Stuart, A.M., M.D., Fellow of the New York Academy of Medicine; Obstetrician of the Brooklyn Hospital, etc. There are numerous illustrations. Price, cloth \$4.00 net. Sheep or morocco \$5.00. Published by W. B. Saunders, Philadelphia, Pa.

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A Text-book of Pathology. By Alfred Stengel, M. D., Instructor in Clinical Medicine in the University of Pennsylvania; Physician to the Philadelphia Hospital, etc. Price, cloth \$4.00; half morocco, \$5.00 net. Published by W. B. Saunders, Philadelphia, Pa.

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DRUGS VERSUS CARDIAC INSUFFICIENCY.*

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I do not intend a long resumé of facts that you all know better than I can tell you, neither do I propose to take into consideration the pathology, etiology or clinical history of heart lesions, but will, with your tolerance, spend a few minutes upon this most serious question which my subject suggests.

For our purpose I will divide cardiac insufficiency into two classes.

1. Incompetence with valvular lesions.
2. Badly acting hearts without valvular lesions.

The first class necessarily divides itself into acute and chronic insufficiency. Let us for a moment picture the former, for rarely has a writer described that cardiac agony as we see it. We hasten to answer the hurry call, and wonder if this time we will arrive before he or she dies. We find the door open and the relatives all in anxious waiting, and looking their joy at our arrival, while the patient's eyes give that longing appeal and say what many times the lips have not breath to utter. We find each patient always in the same position as we have been wont to find him under the same conditions, and each of these sufferers has learned the position that suits him best, viz., always with the head raised, perhaps in bed, perhaps out of it, perhaps sitting, perhaps standing leaning upon the back of a chair, or upon the foot of the bed, but always using every auxiliary respiratory muscle (generally by fixing the arms) to com-

* Read at the Annual Meeting of the New York State Medical Association, October 19, 1898.

bat that most terrible of all things, acute cardiac dyspnoea. The patient is generally bathed in a cold perspiration, and the extremities are often icy cold; he calls for air and to stop fanning all in one breath; he wants his brow wiped off, but nearly goes frantic while it is being done. His noisy groaning expiration, with the wild staring eyes and the agony depicted on his face, shows the suffering he is undergoing. Perhaps incontinence of urine and even faeces, with frequent short coughs, or even hiccoughs, and often vomiting, with frequent stings of cardiac pain, complete the cup of his misery. If you have seen this case at many such times you cannot but ask yourself the question, what right have I to save him and then compel him to suffer again and again like this? I use the word save wittingly, for we physicians do surely save these cases as surely as the surgeon saves with his knife, for this is rarely a case of *vis medicatrix naturae*, and not a case of *post hoc*, but *propter hoc*, if we reach our patient in time.

As every minute may be the last, we ask but few questions, and, if any, mostly of the relatives, but sizing up the conditions begin our treatment.

Our armamentarium consists of digitalin, morphine, strychnine, camphor, nitro-glycerine, atropine, alcohol, and in a few cases venesection. It is more than useless to administer any drugs by the stomach in the above described condition, as there will be no absorption, even if the contents of the stomach are not ejected. The immediate conditions to meet are the very rapid, fluttering and irregular heart, the nervous excitation, the cardiac anxiety, and, perhaps the most important of all, the vasomotor spasm that is so pronounced. Physically we have, then, a heart with leaking or constricted valves, in either case more blood entering the chambers of the heart than can be well gotten rid of by one contraction, while the peripheral resistance, due to the spasm of the blood vessels, becomes greater every minute, which tends still more to interfere with the emptying of the heart. Owing to the well-known stimulus of distension to hollow muscular organs the heart begins to contract faster and faster; soon by some disarrangement of the inhibitory apparatus, the pneumogastric, the heart loses its governor, and the result is 150 or more beats a minute, with irregular contractions, the blood being sent through the arteries with irregular force, as evidenced by the varying volume of the pulse. At this time, with or without cardiac pain which upsets the rhythm of the heart, the patient becomes frightened at the feeling of impending demise, and the cerebral reflexes begin to add to the

cardiac difficulty. The breathing becomes nervously rapid, besides what is due to the rapid heart, the chill of fear is added to the already contracted peripheral vessels, and we get spasmodic contraction of them, and the icy surface of the body. Next the strongly contracted arterial system begins to actually prevent some of the peripheral circulation, and the blood is piled up in the large arteries, while the venous circulation becomes more and more sluggish, the lips, finger nails, and forehead look bluish, and even a diminished amount of blood goes back through the large veins. Respiration becomes more rapid and deep, the inspiration being as strong as possible, every auxiliary muscle taking part, thus making the negative pressure in the chest aid, as far as possible, in bringing the blood back through the veins, the arterial spasm being so great as to impair the ordinary arterial propulsion of the blood. Undoubtedly part of the extra respiratory stimulus comes from the lessened arterial supply to the respiratory center.

Two factors may normally, without treatment, check these cases, and the bad "heart turn" may be cured spontaneously. One is where the patient does not lose his head, so to speak, and has a will-power so strong that he will not get nervous or frightened, and prevents the mental irritation of the heart and also the final peripheral spasm of the blood vessels, and in a shorter or longer time the heart quiets down. We all recognize this power and utilize it by some immediate assurance to the patient, and the caution of "now, don't worry, we will soon have you all right."

The other cause of spontaneous cure is where the exhaustion from the respiratory muscular effort, plus the drowsy condition caused by the cerebral hyperaemia, with, perhaps, imperfectly aerated blood, gives finally a dulling of the mental power and a removal of the nervous excitement, which with the exhaustion gives a relaxation of spasm and the resistance to the flow of the blood is removed, the surface of the body becomes warm, the heart quiets down, and the paroxysm is passed. The part that the nervous system plays in these cardiac paroxysms is shown by our good results obtained from morphine injections even where there is no pain. Hence the use of morphine seems to be directly in line with the natural resolution of the symptoms, viz., quieting the nervous system, causing drowsiness and relaxing spasm, and thus causing increased peripheral circulation, and in many cases this is the only treatment necessary.

However, we have other problems to solve; we do not dare to give a very full dose of morphine lest we impair the action

of the respiratory center, which is already enough in trouble, and undoubtedly death can be easily caused by an over-action of morphine at this time. The addition of atropine to the injection will of course prevent the depression of the morphine on the respiratory center, and will perhaps quiet some of the cardiac pain, but will not steady the heart and may stimulate it, and will increase rather than decrease vaso-motor tension, though peripheral irritations may be diminished. Hence, a fair dose of morphine hypodermically, with a small amount of atropine if respiratory depression is feared, is exactly along the physiological method of bettering the condition.

The more we study the heart and blood vessels the more we see how necessary it is for the heart to have a proper tone to its arterial system in order to act well, consequently we can often hasten the good action of morphine, or rather cause in an entirely different manner the dilatation of the constricted arterioles, by nitroglycerine. If this drug is used hypodermically the dose should be small, not more than 1-200 of a grain. It is, perhaps, better to give the tablet dry on the tongue, say one every fifteen minutes till the frontal throbbing is complained of, and then to stop, as too much will overdo the dilatation of the blood vessels and over-stimulate the heart. I believe, however, that nitroglycerine thus used to good physiological action, combined, perhaps, with a hot foot bath, will generally obviate the necessity for venesection, by bleeding the vessels into themselves.

I prefer nitroglycerine to nitrite of amyl because the results are more under my control.

Suppose we do not exactly follow the natural history course of the resolution of this cardiac paroxysm, but, because of cardiac dilatation, oedema, or passive congestion of the lungs, or other symptoms of cardiac insufficiency, we decide to help the heart directly. We can do this almost with a grip of iron, and of course I refer to digitalis, far and above the queen of all cardiac tonics. The dose of digitalis distinctly depends upon the valvular lesion, and with aortic lesions should never be pushed to a slowing of the heart below 80 beats to the minute, generally given coincidently with nitroglycerine, so that the peripheral resistance be not increased. In mitral disease, and especially in mitral stenosis, we get splendid results from slowing the heart down to 60 and even 50 beats per minute, so that a patient who has not lain flat in bed for weeks may be found with but one pillow under his head when next seen. The prolonged diastole reaches its best use in mitral stenosis, but it

always gives opportunity for better nutrition to the used-up heart. Digitalin is the best form for hypodermic injection, and the dose should be enough not to require repetition in at least three hours, viz., 1-100 to 1-50 of a grain. We must not forget that a patient whose heart has been greatly slowed by digitalis must not rise from the recumbent position even to urinate, until the profound effects have passed off, and a full dose of digitalin will last twelve hours.

The above treatment generally suffices to stop the paroxysm, but if we have cardiac exhaustion, as above shown by paleness of the face, pinched nose, intermittent reduplicating heart, with frequent beats not transmitted to the wrist, we must then have recourse, besides the treatment already suggested, to strychnine, camphor, and small amounts of alcohol.

Strychnine is our best general stimulant, as well as a stimulant to the arterioles and heart, and should be given with free hand, selecting the dose in our judgment required, be it 1-30 or 1-15, hypodermically, but not to be repeated in at least two hours. The flagging nervous centers are all stimulated to do their best work, to tide over the exhausted period until strength and rest are brought to them by a relieved heart.

One of our best cardiac and brain stimulants is camphor, and this in a saturated solution in olive oil and used hypodermically will generally steady a tired and intermittent heart. This injection of a syringe-ful can be repeated every fifteen minutes for three or four times if needed.

I have purposely left alcohol for the last, for except in small amount I am afraid of it in bad cardiac weakness. The secondary effect of alcohol is always that of a vascular paralyzant, and hence an aggravator of cardiac depression, and right here let me deprecate the wholesale use of brandy or whiskey by the hypodermic syringe in ether or chloroform collapse. Whiskey or brandy by the mouth, but little diluted, stimulates the heart reflexly by its burning impact, but with the hypodermic syringe it should be used only in small quantity, viz., a syringe-ful every half hour or hour for a few doses if the results are good.

It is not the province of this paper to enter in great detail upon the treatment of chronic insufficiency, but allow me to say that in lack of cardiac compensation rest is a *sine qua non*, and as a cardiac tonic nothing equals or approaches digitalis, and with proper care, i. e. occasionally watching the amount of urine passed in twenty-four hours, it (*digitalis*) can be given for months, and even for years, without trouble. I most heart-

ily believe that every patient under a cardiac tonic should be seen at least once a month, if not doing very well, and once in two months even if doing perfectly. The physician can then note the rate of the pulse, the tension of it, the tone of the first sound of the heart, the snap of the basic closure, the condition of the bowels, the sleep, the tendency to headache, the tendency to coldness and numbness of extremities, and to nausea or vomiting. We can thus quickly appreciate an excess of digitalis and modify it by reduction, and if we feel that the heart muscles cannot do without a tonic, we can then add, or even substitute, cactus. The latter is a drug, which, if used in good dose (10 to 25 drops of fl. ext.), I find to be a good heart tonic, where there is little or no lack of compensation, but where the heart requires a constant toning. Cactus does not tie up the blood vessels as does digitalis, does not prolong the diastole as does the latter, but strengthens and steadies the heart. We do not have the nausea from it, nor do we have the excretion of urine interfered with, and I wish to emphasize that in a case of lack of compensation where digitalis has restored the compensation, with cactus alone for a short time, or with cactus in combination with digitalis, less of the latter need be given, and most patients can go longer without symptoms of saturation of digitalis, and with a longer period of good compensation, than with any other combination that I have used.

I am accustomed to tell my classes that strophanthus acts "just like digitalis, only less so," which epigrammatic description I believe to be strictly true, viz., less powerful as a cardiac contractor, less of a cardiac slower, less of a vaso-motor constrictor, less of a nauseant, less apt to diminish the amount of urine.

Sparteïn and caffeïn I often find occasion for using for a short time, but more as a change than to meet a serious indication. I think we cannot be too careful to cut down, or if necessary absolutely prohibit, the use of alcohol, coffee and tea in heart cases, and I am not sure that we thoroughly appreciate the intense stimulation to these hearts by coffee, coffee because it is the most used. If we use coffee wittingly with a definite object we are watching the results, but as a beverage I believe these cases are better off without it. Of all minor conditions the bowels in cardiac cases are the most important, not only from the increased passive condition which constipation gives, but from the increased tendency to bowel infection with its head and stomach consequences. Hence the bowels must be carefully moved every day, with that drug or combination of drugs which will accomplish the best result in the given case

with the least disturbance. An occasional small dose of calomel is, I believe, good treatment as relieving portal congestion and as a bowel antiseptic.

For the sake of illustration allow me to quote a case which well shows the results of careful watching of the conditions.

The case is a female, aged 38, with a direct and indirect aortic murmur, and an indirect mitral, with pretty good compensation. She is very easily affected by drugs and the doses must be small. I copy from my notes. September 23, 1897, patient has had a faint turn, and her heart has not been doing well lately. Examination shows the heart to be weak, and the pulse weak but regular. Treatment, tincture of digitalis, 10 gtt. twice a day, and rest. Four days later the heart is still not strong. Treatment, digitalis increased to 12 gtt. twice a day. At the end of a week the pulse was 62 and firm. She complains of numbness and coldness in the right arm and leg. Treatment, spirits ammon. aromat. 1-2 teaspoonful p.r.n. reduced digitalis to 10 gtt. and gave 10 gtt. cactus (fl. ext.) at noon. Urine O. K. In another week the numbness had disappeared, the heart was doing better. The ammonia was stopped and tr. digitalis reduced to 8 gtt. a. m. and p. m., cactus continued, viz., 10 gtt. at noon. The next week, i. e. three weeks from the beginning of the record, patient had some head pressure and some asthma (cardiac). Treatment, 1-200 nitroglycerine on the tongue when asthma attacks come on. Digitalis reduced to 6 gtt. b.d., cactus continued as before. Given strychnine sulph. 1-60 t.i.d. On October 13, just one month from the beginning of the record, the whole condition is improved; stopped strychnine and continued digitalis and cactus as above, viz., 6 gtt. of the former b.d., and 10 gtt. of the latter at noon. February 28, five months from the beginning of this record and four months since last seen, the patient has been doing finely on above dosage, but now she is not as well. Pulse slow but not strong, head all right, no coldness or numbness. Treatment, 8 gtt. digitalis a. m. and p. m., and cactus unchanged. Strychnine 1-60, and a teaspoonful of whiskey t.i.d. One week later, March 5, felt a little cold, otherwise feels better. Reduced digitalis to 6 gtt. a. m. and p. m., and cactus, strychnine and whiskey continued. March 15, ten days later, doing very nicely. Stopped strychnine and whiskey and continued heart drugs as above, which is the same dosage which went from October 13 to February 28 so successfully, which, by the way, is less than she had during 1896. Since March 15 she has been at the same dosage and doing finely.

This case could be multiplied over and over again, but the description of other cases could only emphasize the fact so well brought out by this one, that good care and careful judgment are needed in these cases of chronic heart disease, and such being given will always bear good results.

2d. Insufficient hearts without valvular lesions.

First, let us consider that ever increasing bugaboo of "heart failure." We have the real heart failure of over ether or chloroform narcosis, and that due to shock. Here we have a weak, faintly acting heart, with dilated peripheral blood vessels, and great loss of heat. If there has been hemorrhage of course nothing can take the place of saline transfusion, and I heartily commend the giving of a normal saline solution, by high injection per rectum, as routine practice after every severe or prolonged operation, whether much blood has been lost or not. It tends to fill up the blood vessels and reduce the thirst that perhaps for some time cannot be well relieved by the stomach on account of nausea, and also prevents the tendency to kidney congestion by establishing early a free flow of urine.

Our first treatment of this cardiac failure is heat to the extremities and heart, and perhaps to the body, and elevation of the feet and legs to aid in the return of the blood in the veins, which have lost the force from behind, viz., the elasticity of the arteries by the latter's dilatation. We can also aid the flow of venous blood to the chest by artificial respiration, first by increasing the negative pressure in the chest and then the forcible expiration giving more force to the aortic impulse. As to drugs, good treatment is an occasional careful whiff of ammonia salts to the nostrils and a hypodermic of strychnine in good dose, atropine in a dose not to be repeated, several injections of camphor as above described, and brandy once or twice, but not repeated in at least an hour. Digitalin may be used with care if the heart rallies, but shows signs of recurring weakness. Electricity can be used if needed.

Now what shall we say for "heart failure?" Is it a malarial or la grippe nomenclature for an undiagnosed condition, or are we having more and more frequent cases of suddenly, or perhaps chronically, weak hearts, for which there is no, or at least the most careful of us can find no assignable cause. I think the latter proposition is true, but as I stated in the beginning that we are not dealing with causes here, I will not even venture a suggestion of possible causes; suffice it to say that we are frequently called to treat a weak heart. True heart failure can occur alone, or, of course, during the progress of various

diseases, but its treatment will be generally the same from whatever cause, and that suggested for heart failure in ether narcosis is perhaps equally applicable to ordinary heart failure with this difference, viz., that we have the brain with us and will get all of the voluntary help that we can from an increased respiration. Here we get the best results from brandy or champagne by the mouth, and from black coffee if there is no vomiting. Hypodermics of strychnine and atropine and camphor are the reliables, with digitalin if the pulse is fast; if the pulse is slow I believe it to be contra-indicated.

A chronically weak heart without valvular lesion is best treated by strychnine and small doses of digitalis or cactus, with, as a stimulant, camphor or ammonia regularly for a week or two, which I find better than whiskey or coffee. A complete rigid regulation of the life and habits of the patient are absolutely essential, and a removal, if possible, from the nervous causes which play so important a part in this cardiac weakness and irritability, and is often the forerunner of neurasthenia.

In nervous and irritable hearts, as are typically seen in chronic tobacco poisoning, nothing can surpass strychnine in full doses, and digitalis in small doses, or full doses of cactus. Weak, irregular hearts occurring from any other cause or condition should be treated on the same general basis as laid down above, modified by the condition present.

I trust that I may have caused enough interest in the physico-dynamics of cardiac insufficiency to lead all of our heart cases to be carefully studied. I cannot but thank you for your courteous tolerance to so well-worn a subject.

URETHRAL STRICTURE; A FEW THOUGHTS ON ITS GENESIS AND MANAGEMENT.*

By J. W. S. GOULEY, M.D., NEW YORK CITY.

The little time allotted to each participant in the present discussion on urethral inflammation and its effects, has rendered it necessary for the writer to confine himself to the statement of only a few thoughts on the genesis and management of idiopathic stricture.

1. Half a century ago stricture was regarded as due solely to damage done the mucous membrane by local treatment of urethral inflammation. Undoubtedly the old heroic treatment of acute urethritis often did such violence to the canal as to give rise to the worst kind of stricture; but stricture was then known to occur after urethritis that had not been subjected to this so-called abortive treatment, and in these cases the cause was unexplained.

2. It has since been made clear that urethritis is the real germ of stricture, that without treatment the phlegmasiac process is continuous from incubation to confirmed stricture, and that when the acute urethritis is rightly treated and speedily and completely cured, the nascent stricture is nipped in the bud. Therefore, in general terms, may it not be said that acute urethritis is a stricture *in posse*, and chronic urethritis a stricture *in embryo*?

3. After acute or sub-acute urethritis, stricture is of slow formation, and it may be years before the urethral calibre is seriously reduced; while super-acute urethritis, with involvement of the spongy substance, is likely to give rise, in a few months, to a rapidly contracting and distressing stricture.

4. There does not seem to be any tissue peculiar to stricture, as was formerly believed; the stenotic process, in the vast majorities of cases, being the effect of chronic urethritis with inadequate repair of local epithelial exfoliation and the consequent formation of a scar tissue that is progressively undergoing sclerous degeneration and contraction precisely as does the scar tissue of some severe burns of the skin.

* Read at the Fourteenth Annual Meeting of the Fifth District Branch of the New York State Medical Association held on May 24, 1898.

5. Hence chronic urethritis, regarded as a stricture in embryo, demands, beside other local treatment, the long continued use of dilating instruments as preventive of the steady contraction of the canal which otherwise would surely occur. It should, however, be remembered that every chronic urethral discharge is not necessarily dependent upon urethral inflammation, and that chronic urethritis often exists without any discharge that is perceptible to the unaided eye.

6. The inodular masses felt in the vicinity of old strictures are often due to inflammatory action caused by extravasation of a few drops of urine in the peri-urethral connective tissue, leading to the establishment of a fistula, and have no direct relation to the sclerous tissue which had given rise to diminution of the urethral calibre.

7. As a general rule, in narrow resilient strictures following urethritis, the mucous membrane and thin layer of underlying connective tissue only are affected and, instead of a thick ring of inodular tissue, there is in reality, as already said, sclerous degeneration of a mere film of scar tissue with destruction of adjacent mucous glands. Therefore there is nothing requiring absorption, but on the contrary there is need of regeneration of tissue, the promotion of which is effected by making, in the long axis of the canal, a gap which is soon filled with granulations that gradually become organized. The urethra, at the seat of disease, is thus spliced by new scar-tissue and the splice is kept as wide as possible, during the healing process, by the persistent periodical employment of dilating instruments, the use of which is continued until the cicatrix ceases to contract.

8. Confirmed, but not narrow or resilient strictures, are ordinarily cured by gradual dilatation, which, however, when carried to high numbers of the catheter scale, does not merely stretch, but does split the mucous membrane and break up the fibrillae of the scar, and this process of divulsion manifests itself by the slight hemorrhage following the last catheterism. At this moment two or three larger instruments are passed in succession to ensure the required extension of the resulting gap, which is kept patent by periodical dilatation until the parts are completely healed, and for a long while thereafter.

9. In cases of narrow resilient strictures of the ante-scrotal region, internal urethrotomy and subsequent prolonged periodical dilatation are clearly indicated as they are in those narrowings of the meatus and of the fossa navicularis, which are so refractory to other methods of treatment. However, incision

of the meatus should never be so extended as to cause the traumatic hypospadiac monstrosity that has heretofore been so common and so injurious to body and mind.

10. Narrow strictures in the scrotal and perineal regions of the urethra, even when admitting only capillary bougies, are generally amenable to the process of divulsion described by the writer in a paper presented to this association in the year 1895. The divulsion is effected, at one or two sittings, by the successive introduction of conical tunnelled sounds, slid over a whalebone conductor from No. 1 to No. 14 or 15.

11. The sudden and violent modes of divulsion so much in vogue thirty years ago, have since been condemned by prudent and judicious surgeons, and are now seldom heard of.

12. The capillary probe-pointed bougie elbowed at its vesical extremity is particularly well adapted for the entrance of a narrow stricture with eccentric lumen and for serving as conductor to the tunnelled catheter or sound.

13. In case a stricture proves undilatable beyond No. 2, a web bougie of that size is introduced and retained in position forty-eight hours—the urine meanwhile trickling at its side—with the effect of soon facilitating divulsion or urethrotomy.

14. When a narrow stricture, in the perineal region, is refractory to the dilatation preliminary to divulsion, or when it is complicated with fistulæ or with urinary extravasation, the safest resource is external perineal urethrotomy followed by periodical dilating catheterism long after cicatrization of the parts.

15. Close observation and mature experience have taught surgeons that there is no known method of treating stricture that does not require the periodical use of urethral dilators for a long time after the stricture has seemed to be cured; gradual dilatation, divulsion, internal and external urethrotomy being only means to the desired end, which is the restoration of the normal calibre and suppleness of the urethra.

16. Unduly frequent and excessive dilatation of the urethra, say to No. 20 (Engl.) applied every day or two, seems to be an unwise and irrational procedure which often leads not only to loss of the suppleness of the mucous membrane, but to permanent contracture of the whole canal; such abuse of the large sounds being practically the infliction of a series of traumatismes exciting a urethritis whose exudate in the meshes of the ambient connective tissue constantly undergoes sclerous degeneration, the entire canal finally assuming a condition which may be likened to that of an old, hardened, inelastic India rubber tube.

RESUMÉ OF RICKETS.

CHARLES ALLING TUTTLE, M.D., NEW HAVEN, CONN.

Read before the New York State Medical Association, Fifteenth Annual Meeting, October 18-20, 1898, Mott Memorial Hall.

By far the most frequent cause of all deformities which have come under my observation has been rickets—and as I find little time comparable with its importance given it in the ordinary medical course, I may be pardoned if I ask your attention to some special observations on a number of cases (twenty-five in all) which I have recently seen.

That we may have a common footing let me give the following definition of rickets, viz.: Rickets is a constitutional malady acquired through mal-assimilation, characterized by impaired nutrition and alteration in the growing bones and terminating spontaneously after an indefinite period. This definition, although somewhat cumbersome, is, I believe, the best that has yet been formulated.

Rickets is found in every part of the known world, but is more especially common in the cold and more moist climates. It affects more particularly the poor of our great cities, where hygienic conditions are most unfavorable, where even light, ventilation and good nourishment demand an unpurchaseable premium, and where food primarily of poorest quality and insufficient quantity is carelessly and inefficiently prepared.

The first and most striking pathological condition found in rachitis is in the bones, and especially in the epiphyseal junction of the long bones or ribs. Their ends show early a tendency to increase in size and prominence out of all proportion to the normal—are soft, tender and yielding to pressure and bend under superincumbent weight or muscular contraction. Investigating the cause of the change in bony contour and quality, the periosteum is found to be thickened and congested, and together with the underlying bone structure infiltrated with a spongoid, jelly-like fluid. As the direct result of

this pathological condition, there must follow imperfect and delayed ossification and an arrest of the deposit of inorganic matter in the surrounding bony structure.

The complete series of changes which the bone undergoes in rickets has been the subject of minute investigation by Marcoli, and his results thus formulated:

First—Stage of rarification or congestion. This is also called the stage of effusion. The bone is dark in color, soft and tender, but not deformed.

Second—Stage of softening and swelling—also called the stage of deformity, because in this period the twisting and distorting and enlarging of the epiphysis occurs, and the diaphysis is curved—if at all.

Third—Stage of consolidation or sclerosis. Here the bones previously deficient in inorganic matter return to their normal constituency, or may surpass the percentage of lime salts in the normal bone.

Rickets may be “partial” or “general,” viz., may be confined to one or two bones or one or two extremities, which is usual in adolescents, but it is also found attacking the whole osseous system, which is the common form with infants. We might again divide it for convenience of description and study as to the time of its appearance into four periods, namely:

First—Intra-uterine rickets—due to heredity influences and condition (primary error in the germs, etc.), with malnutrition of the fœtus.

Second—Infantile rickets, showing itself from the second to the seventh month.

Third—Adolescent rickets, such as seen in nephritis and other wasting and chronic diseases.

Fourth—Senile rickets—due to devitalizing influences of age, rapid child-bearing and dissipation.

The onset is insidious to the last degree. It is only after an extended period of vague general symptoms, such as slight fever, diarrhoea, disturbance of digestion, tendency toward catarrhal affections, profuse perspiration, all of which might be significant of tuberculosis or syphilis, that the general nutrition of the body diminishes and the alteration of the bones appear.

What is the all underlying cause? All writers agree in at least one particular, that a deficiency in the percentage of lime salts exists in all cases, and to explain its causes various theories have been propounded. There are to-day, however, five only that have any weight of authority. These are:

First—The so-called mineral theory—advocated by Virchow and Jenner. This presupposes a deficiency in the supply of the mineral constituency from the blood and that the lessened percentage of lime salts in the blood the essential lesion.

Second—The acid theory championed by Foucroy assumes the primarily normally calcified bone deprived of a portion of its lime salts by some substance such as carbonic or lactic acid in the blood.

Third—The vaso-nervous theory of Mayow and reiterated by Hoffman and Allen, and later by Perry, assumes it to be due to some morbid condition of the nervous system, acting especially through some inhibitory influences upon the spinal cord.

Fourth—The microbic theory, which contends for the microbic nature of the disease, was propounded by Marcoli and is still stoutly contended for by him. He believes that the disease is produced by the action of the ordinary pyogenic organisms upon the osseous and nervous systems. This theory, while in keeping with our modern pathological tendencies, has little other than theory and animal experimentation to support it.

Fifth—And most probable theory—the inflammatory theory. This maintains that the cause is primarily a chronic inflammatory condition beginning in the bone forming tissues, and has to-day the most authoritative indorsement. There can be no question but that rickets is due to disturbed nutrition from the arterial blood and the changes in the long bones to excessive vascularity.

The osteal changes occur first in the cranial bones and ribs, then in the radius and ulna. Later pelvic deformities are not uncommon, and are of much importance in female children; occasionally also the vertebræ and intravertebral cartilages are effected with accompanying spinal curvatures. In the early stages rickets is frequently mistaken for other diseases, and it is at times impossible to make the diagnosis before deformity has appeared. It is liable to be mistaken for chronic diarrhœa, rheumatism, syphilis, general malaise and malaisal toxæmia. In all such suspicious cases the deformity should be carefully watched for, and during the time, an expectant dietary rigorously carried out. Early syphilis and early rachitis have a striking resemblance, but with the appearance of the deformity there need be no further question for the osseous deformity of syphilis is not only not confined to the epiphysis, but seems to have a predilection for the shaft.

PROGNOSIS.—Under proper treatment the prognosis of rickets is good. The evolution is a long process accompanied by a slow progressive improvement of the general nutrition, and a resulting anæmic and marasmic condition requiring especial care. But the innate tendency of the disease is towards a spontaneous cure, which is reached usually only after years, though its course under proper conditions and treatment may be materially abridged. Complications from which death may result occur at almost any stage of the disease. There may be pneumonia, bronchitis, laryngismus stridulus, hydrocephalus or amyloid degeneration of the viscera. Certain inherent conditions of the mother predispose to rickets, and when they exist render the prognosis less favorable. There may be ill-health, mal-nutrition or disease of the mother during pregnancy, numerous rapid or multiple pregnancies, age of mother at birth of child—40 or over—lactation during pregnancy, heredity, syphilis.

TREATMENT.—The treatment of rickets is prophylactic, medicinal, mechanical and operative. The institution of preventive measures is a matter of first importance, and by simple means directed to the above ante-partum causal factors in the mother, rickets may, in a large proportion of cases, be prevented. Prophylaxis also embraces the appropriate feeding and hygienic care of the child. During the period of gestation the general health of the mother should be kept to the highest possible degree, free from care and worry. She should live in the best possible hygienic and sanitary surroundings, with an abundance of fresh air and exercise, have plenty of and well-prepared food. The common fad of American mothers, upon the most flimsy excuse, not to nurse their children cannot be too strongly condemned. Should, however, it not be possible after a thorough and earnest trial to nurse the child, it must be hand-fed—an unfortunate condition for child, mother and physician.

There has been in my hands no artificial food comparable with good cow's milk. This, sterilized, pasteurized and diluted with proper proportion of oatmeal or barley gruel or sterilized water, with the addition of one or two drachms of aqua calcis, produces an artificial food at once cheap, easily procured and prepared, and efficient. Babies kept upon this usually thrive, become robust and hearty, and with much more resistant powers to the children's diseases than the fat yet anaemic babies of the factory prepared foods. The hygienic care of the child consists of a daily bath in tepid salt water, followed by vigorous rubbing, warm woolen clothing—yet not overburdened

—plenty of high and dry air out of door, and good sanitation in the house. These surroundings and feeding, as above indicated, will almost surely forestall any predisposition which could possibly exist.

The medicinal treatment, while secondary to the hygienic, is yet of measurable value. The general condition should be improved by cod liver oil, and to such an extent has improvement under it been noticed that by some writers it is considered a specific. This or maltine, either alone or in combination with the lacto-phosphate of lime, is certainly productive of good results, yet I have been able to obtain my best results from the use of *oleum phosphoratum* as recommended by Jacobi. This I give before eating and *syrupus ferri iodidi* in appropriate doses after. These are usually well borne, and in many cases an improvement can be noted after a week. In the few cases in which it has been necessary to discontinue the treatment after a few weeks I have used Fowler's solution in the meantime, but return to the original prescription after the shortest possible time.

If now all these measures have been neglected and the child has been allowed to go untreated until bony deformity has taken place, is emaciated, anaemic and marasmic, a condition is presented which will require at our hands as orthopædists not only hygienic and dietetic supervision, but in addition mechanical and perhaps operative. It is not my purpose in this paper to discuss any of the various mechanical devices to prevent and to cure rickets deformities or to rehearse the numerous operative procedures which are at our command. Suffice it to say that in the correction of these deformities we have some of the most brilliant results of modern surgery, through which the unfortunate, decrepit, deformed and dependent person has been made to walk erect, to be released of much physical and psychical pain, and to be made useful, self-supporting members of the community.

REPORT OF A FATAL CASE OF PHARYNGEAL HEMORRHAGE.

BY GEORGE EMERSON BREWER, M.D.,

Attending Surgeon City Hospital, Assistant Demonstrator of Anatomy College of Physicians and Surgeons, New York.

The object of this communication is to report and place on record the history of a case in which a fatal hemorrhage occurred from a comparatively insignificant wound, probably occasioned by the rupture of a small abscess upon the posterior surface of the soft palate.

The patient, a well-developed, vigorous young man of twenty-five, sent for the writer on November 13, 1895. He stated at that time that seven or eight days before my visit he had noticed the symptoms of an ordinary sore throat. There was some difficulty in swallowing, with pain, redness and swelling in the region of the left tonsil, accompanied by slight fever and malaise. He consulted a physician, who examined his throat and advised appropriate remedies.

The symptoms continued, and after two or three days had increased in severity to such an extent that the attending physician suspected the presence of a peritonsillar phlegmon, and explained to the patient that his symptoms would be speedily and completely relieved as soon as the pus was evacuated. At that time there was a moderate amount of oedema of the palate and uvula, but not enough to lead the attending physician to regard the case as other than an extremely mild quinsy. In fact, at no time were the symptoms severe enough to keep the patient in bed. A day or two later an apparent rupture occurred, which was followed by a small amount of hemorrhage. Immediately after this the pain and swelling rapidly subsided—but from time to time slight hemorrhages occurred, lasting for a few moments and ceasing spontaneously.

Although his attending physician did not regard the condition as serious—failing to understand why the hemorrhages continued after the apparent subsidence of all inflammatory

symptoms, he advised a consultation with a specialist in throat diseases, with a view to accurately locating the bleeding point, and, if possible, applying astringent treatment.

From the history of this interview given me by the patient, some misunderstanding must have existed regarding the advice of the specialist, for shortly after leaving his office the patient went down town to attend to some matters of business, and while seated in a broker's office, conversing with an acquaintance, a hemorrhage occurred which resulted in syncope. Like the previous hemorrhages, however, it ceased spontaneously. He was taken to his hotel in a cab and passed the remainder of the afternoon without further trouble.

It was on the evening of this day that I saw him for the first time. At the time of my visit he complained of no symptoms other than a feeling of weakness and a slight sense of fullness and discomfort in the left side of the throat—temperature $100\frac{1}{2}^{\circ}$, pulse 120. On examining the throat, the region of the left tonsil seemed slightly more prominent and congested than the corresponding region on the other side. The left half of the soft palate was somewhat thickened, uvula nearly normal. A small clot of blood was seen adherent to the left posterior pillar extending upward into the pharynx.

Absolute rest in bed was advised with liquid diet. A bottle of peroxide of hydrogen was left with directions for making a 5-volume solution to be used through the nose and mouth in case of further hemorrhage.

He passed a comfortable night, and in the morning his temperature was found to be normal, pulse about 100.

Being anxious to make a thorough examination of the nose and upper pharynx, and as it was impossible in his hotel to obtain a suitable light, he was advised to ride to my office later in the day, provided no further bleeding occurred.

As a result of this examination it was found that the nasal cavities were apparently normal; and that the naso-pharynx was free from growth or disease of any kind. On the posterior surface of the soft palate, a little above the junction of its free border with the posterior pillar, was a small granulating surface, covered with a small, firm clot of blood. As the throat was an easy one to examine, it was possible to positively exclude any other source of pharyngeal hemorrhage. The region was thoroughly sprayed with Dobell, a solution of tannin, and with peroxide of hydrogen, without causing a renewal of the bleeding. Five hours later, while resting quietly in bed, and, as I was assured, without apparent exciting cause, the hemorrhage suddenly re-

curred and continued violently for several minutes. It was checked, however, by the prompt use of peroxide of hydrogen, and when I reached him, half an hour later, had entirely ceased. The patient, however, showed evidence of a very considerable loss of blood, as there was marked pallor, cold extremities, and a rapid, feeble pulse. I had him removed to a larger room, telephoned for a trained nurse, sent for plugging and transfusion appliances, and remained with him all night.

Large nutritive enemata were given at frequent intervals, together with strychnine and digitalis, hypodermically. By morning his condition had considerably improved. The pulse was stronger. He had slept several hours; seemed refreshed, and asked for milk. During the day this improvement continued with no sign of returning hemorrhage. He passed a restful night until toward morning, when another hemorrhage occurred. This was quickly checked by the use of peroxide of hydrogen, and although he lost but a small amount of blood, yet his condition was such that it produced no small measure of prostration.

Dr. G. K. Swinburne saw the case with me, and after consultation it was decided that some attempt must be made to exert pressure on the bleeding point. Recognizing the fact that plugging the posterior nares and pharynx could do no possible good, a thick roll of gauze was made, $2\frac{1}{2}$ inches in length, held together at each end by heavy encircling silk ligatures, which were continued as long loops for traction through the nose and mouth. A Bellocoq cannula was then introduced through the left nostril, and the loop of silk extending from the upper extremity of the gauze roll was drawn through the mouth, pharynx and nose. The gauze was then drawn snugly into place and the loop attached to the lower segment of gauze brought out through the mouth and tightly tied to the nasal loop. This resulted in the application of a very considerable amount of pressure immediately over the bleeding point. No hemorrhage followed the application of the gauze, which was accomplished in less than two minutes. The case was seen by Dr. Swinburne or myself every two hours during the day.

Although the pressure resulted in a very considerable amount of discomfort, the patient bore it with much fortitude and made no complaint. For six hours he did well. At two o'clock in the afternoon he was seen by Dr. Swinburne, who regarded his condition as favorable. Within five minutes from the time Dr. Swinburne left his room, as a result of a violent attack of coughing, the bleeding recurred and resulted in complete and fatal exsanguination before anything could be done to check it.

FATAL CASE OF PHARYNGEAL HEMORRHAGE. 91

I am aware that a number of cases of fatal hemorrhage have been reported as a result of extensive peritonsillar suppuration, but I have been unable to find the record of any case in which a fatal hemorrhage has followed disease of this nature, so limited in extent and accompanied by such trivial symptoms.

The writer is strongly of the opinion that the indications in this, as well as in all cases of copious, recurring pharyngeal hemorrhage, are for an early ligation of the common carotid artery; and he believes that had this been done in the case reported above, that the patient's life would have been saved.

THE TECHNIQUE OF THE OPERATIVE TREATMENT OF INTESTINAL OBSTRUCTION.

[An abstract from a paper read at the annual meeting of the New York State Medical Association, October 19-20, 1898.]

Dr. Frederick Holme Wiggin, of New York, read a paper with this title, it being a contribution to the discussion of the general subject of "Intestinal Obstruction." He said that the various conditions for which operations are usually demanded are: (1) Strangulation of the gut by bands, extensive adhesions or apertures; (2) volvulus; (3) intussusception; (4) obstructions due to neoplasms; (5) compression by tumors external to the gut; (6) obstruction from foreign bodies, such as gallstones and enteroliths; and (7) obstruction caused by fecal masses.

Where the case is one of acute intestinal obstruction there is but little time for preparation. The loose pieces of furniture should be removed from the room selected for the operation, and sheets wet with carbolic acid solution, 1 to 20, or bichloride solution, to 500, should be placed over the carpet. In this preparation of the room it is important that no dust be raised. The instruments are boiled for ten minutes in a two per cent. solution of carbonate of soda and are then placed in trays containing sterilized water. The towels may be sterilized in a special sterilizer or by boiling. A large quantity of saline solution (one teaspoonful of common salt to the quart of water) should be on hand, and a wash-boiler, after thorough cleansing, should be filled with water which should be sterilized by boiling for an hour. Some of this water is then rapidly cooled in pitchers surrounded by ice. Where there is great haste, it is admissible to take the water from the hot water faucet. If there has been much vomiting, or if there is considerable abdominal distension, it will be well to follow Kussmaul's suggestion, to wash out the stomach with saline or boric acid solution. If, in addition, the patient is much prostrated, and does not respond well to the ordinary cardiac stimulants, from one to three pints of saline solution should be injected into the veins.

The patient having been anæsthetized, the skin over the field of operation is treated successively with the following : (1) green soap; (2) hydrogen dioxide; (3) lathered and shaved; (4) water; (5) equal parts of alcohol and ether; (6) 1 to 500 bichloride solution in alcohol; and (7) sterile water or saline solution. The bladder should then be emptied by catheter. When the site of obstruction cannot be definitely located, an incision, four inches long, should be made through the right rectus muscle, between the umbilicus and the pubes. If distended coils of intestine obscure the view, they should be aspirated or incised, and the wounds so made closed by suture, and the parts disinfected with hydrogen dioxide. The first effort of the operator should be to find the caecum. If it is greatly distended there is good reason to believe that the obstruction is in the colon, but if there is little or no distention, it is probable that the stoppage is in the small intestine. The rectum should, of course, be explored prior to the abdominal section. Where the obstruction is supposed to be in the colon, the hand should be passed over the entire length of the large bowel, or until the obstruction is found. Where the obstruction is suspected to be in the small intestine, the operator should look along the brim of the pelvis and in the region of the caecum for the collapsed portion of bowel, and follow this down to the obstruction. The various hernial orifices should also be examined, remembering that sometimes two forms of obstruction may co-exist.

If the obstruction is caused by bands, these should be ligated on both sides near their attachment, and removed. If a diverticulum or an adherent appendix is the cause of the trouble, these portions of the bowel should be removed in the ordinary manner, and the opening in the gut closed with Lembert sutures. According to the writer's experience, when volvulus occurs in the small intestine it is not only safe, but desirable, to draw the intestine out of the abdomen, taking care to keep it hot and moist by wrapping it in gauze or soft towels wrung out of hot saline solution. Where an intussusception is the cause of the obstruction, the tumor should be encircled below its apex by the finger and thumb, and the sheath held a few inches lower down, while the apex of the tumor is pushed upward. Traction from above the tumor should not be employed. If the intussusception is irreducible, the following method, described by Maunsell, is recommended: A slit is made in the intussusciens and gentle traction is exerted on the intussusceptum until its neck appears outside the opening in the intussusciens. The base is then transfixed with two straight needles,

armed with horsehair, and the intussusception is amputated one-fourth of an inch above the needle. The sutures are now passed through the invaginated bowel, caught up in the interior of the bowel, divided and tied. The invagination is then reduced, and the slit closed. Thanks to modern surgery, most neoplasm causing intestinal obstruction can be removed, and naturally such a course is preferable to colotomy. Where it is inadvisable to resect the portion of bowel containing the growth, an incision, four inches long, should be made over this portion, in the direction of the fibres of the external oblique, and the bowel drawn upward until its mesenteric attachment is on a level with the external incision. A slit is then made in the mesentery and a glass rod is passed through, and iodoform gauze wound around the ends of the rod. The rod is left in position until adhesions have formed, when the gut is opened.

When the intestinal obstruction results from the pressure of a neoplasm external to the gut, the new growth should be extirpated, but if this is not possible, a fecal fistula must be established above the point of obstruction. Gallstones or enteroliths causing obstruction should be pushed a little upward or downward, and then removed through an incision. The object of this is to avoid making the opening through the portion of the gut which is likely to have been damaged by pressure. Fecal accumulations causing obstruction are best removed by a high enema of saline solution, injected at a temperature of 100° F. by means of a fountain syringe raised three feet above the patient. The flow should be intermitted from time to time as the patient complains of distention or colic. The enema should be retained as long as possible, for the object in giving it is to secure the softening of the mass rather than to stimulate peristalsis. The procedure may be repeated several times, and its action assisted by the administration of small doses of calomel and soda.

When the gut is found to be gangrenous, in a case of intestinal obstruction, an end-to-end anastomosis should be effected, and for this purpose Dr. Wiggin prefers his modification of Maunsell's method. The modification consists in doing away with the invagination and the slit. The portion of intestine to be extirpated is emptied of its contents by pressure. The portion to be removed is then isolated by clamps on either side, and a V-shaped incision is made, having its apex in the mesentery. The mesenteric vessels are ligated before being cut, and the wound in the mesentery is sutured. After washing the divided ends of the bowel with hydrogen dioxide, they are united by two sutures passing through all the intestinal coats,

the first suture being at the inferior or mesenteric border, and the second directly opposite at the highest point. The third and fourth sutures are passed on either side half way between the first two. The other sutures are passed in the same way, the needle going from within the gut and piercing all the coats, then back through the peritoneal, muscular and mucous coats to the interior of the other segment of bowel. The ends are then tied in the bowel. This process is continued until all the sutures but one or two are passed. For the latter, Lembert sutures are substituted. If the sutures have been properly inserted and tied, the peritoneum will now be turned in and the stitches hidden.

The operation having been completed, and the dressings applied, the patient is placed between the folds of a warm blanket and only a little warm water allowed by mouth for the first twelve or eighteen hours. Then a few drachm doses of liquid peptonoids are given at intervals of twenty minutes, and, if well borne, peptonized milk is added. The tendency is to give too small quantities of food at too frequent intervals. The bowels are moved on the third or fourth day by small doses of calomel and soda.

In closing, Dr. Wiggins laid great emphasis on the fact that the prognosis in this class of cases depends more upon the promptness with which surgical treatment is instituted than upon any other factor.

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THE resignation of the President of the University, Dr. Timothy Dwight, brings a deep sense of regret to Faculty, Alumni and members of the Medical Department. The thirteen years of his administration have been among the most important in the history of the Medical School. Assuming office two years after its complete union with the University, he has successfully brought the school through a critical period. The higher standards, the broader courses, the quadrupled funds, and the steady growth of the Yale Medical School, have been a part of the successes of this period.

For the University as a whole, the work of President Dwight has been eminent. Completely in touch with the New Yale, its needs, its limitations, its opportunities, he has with rare tact quietly eliminated what was unfitted to the new conditions, has adapted to the new structure the old foundations, and yet retained all the sound old traditions. He has developed a University—the New Yale.

Peculiarly fitted for his position by the possession of a rare knowledge of human nature, his wit, tact and essential human qualities have endeared him to all; while his far-seeing, progressive policy, tempered by the true spirit of Yale conservatism, have gained him universal esteem.

We, who have had the privilege of his leadership owe him a lasting debt of gratitude; and to us the announcement of his resignation brings a feeling of personal loss.

* * *

We note with pleasure that the Yale Medical Alumni Association will during the coming winter conduct its second annual course of lectures. These lectures will, as usual, be open to the medical profession and students of the Yale Medical School. Through the kindness of the Association, there will thus be afforded the opportunity of hearing some of the most eminent specialists in the profession upon subjects of live interest to the practicing physician, presented in a form adapted to his needs. The first lecture, official notice of which appears in another column, will be delivered by Prof. Lewellys F. Barker, M.B. (Univ. Toronto), associate professor of anatomy and pathology at Johns Hopkins University. His subject, "Nervous Anatomy," is one upon which he has done a large amount of original work, and his lecture, accompanied, as it will be, by many illustrations, will be especially interesting and instructive. It hardly seems necessary for us to urge that you, by your attendance, support such a course of lectures as our Alumni Association offers us, for no progressive practitioner can afford to neglect the opportunity of hearing them.

* * *

ALTHOUGH every public commission is subject to public comment and challenge, and, indeed, honest, healthy criticism is always in order, and even necessary, yet, in view of the recent attack made upon our State Board of Health, it might be well to give an outline of a few of their duties; for the purpose, however, of procuring a more just appreciation in general regarding the efforts of that Board, rather than to defend or excuse them from any criticisms that have been made, inasmuch as we are unqualified at present to render an intelligent judgment upon the questions at issue. The Connecticut Board of Health has always efficiently performed the duties common to such committees. Epidemics of typhoid fever and the other infectious diseases have been thoroughly investigated after the most modern scientific methods, and all matters of public hygiene and sanitation carefully supervised. By the action of our last Legislature, moreover, through their own instrumentation, new and onerous duties were placed upon this Board,

which make their annual reports on vital statistics and contagious diseases second to none in the Union. Instead of the town registrar carelessly and often ignorantly making an annual abstract of the vital statistics reported to him, he is obliged to return monthly to the Secretary of the State Board copies of all birth, death and marriage certificates recorded by him. The town health officer is required to render a complete monthly report of all contagious diseases occurring in his town. These reports are put upon file in the State Secretary's office in such a manner as to make them easily accessible and valuable for future reference, and are systematically set forth in the annual report of the Board. After a trial of a year and a half, the plan seems to be in every way advantageous, practical and successful, and Connecticut is certainly to be congratulated upon having so perfected a system of recording her vital statistics. A few figures may partially illustrate its good results. During the past year scarlet fever was reported from ninety-two towns with a computed death rate of about $2\frac{1}{2}$ per cent.; measles from every town with a death rate of less than 1 per cent.; typhoid fever from 104 towns with a death rate of 5.8 per cent.; and diphtheria from 102 towns with a death rate of 23 per cent. From this it would seem that while scarlet fever was early and easily recognized and feared so that therapeutic and hygienic measures could profitably be employed, diphtheria in the early stages was more difficult of recognition with a consequential very high death rate; showing that practitioners, and the laity as well, cannot be too careful in their outlook for, and early treatment of, this disease, which is to be feared so much more than typhoid or scarlet fever.

* * *

WITH the prevalence of defective eyesight, whether congenital or acquired through the conditions of childhood, our profession is familiar. To care for the eyes of the youth, soon to be the defenders and rulers of the republic, is the duty of the community. Long after the advent of the century soon to close, cylindric lenses for astigmatism were undiscovered. Children who did not see well were regarded as mentally defective, and were given work, not books. To-day such pupils wear correcting glasses, compete with their fellows, and are excluded from no employment or profession. During the last thirty years, impairment of the eyesight, under the conditions of modern life, has been carefully studied. Short-sightedness

is virtually the result of civilization. Prevention, or the application of proper remedies, is the obligation of the state which assumes the control and education of its children. Such remedies are limitation and interruption of the hours of study, properly constructed and properly lighted schools, suitably adjusted furniture, well selected and well printed books, and, above all, entrance examinations. Gradually the importance of these matters is gaining public recognition and action. Note governmental restriction of study hours on the Continent, a reference to the lighting of schools in recent legislation of our own state, school visitors being required to report to proper authority if the lighting is defective, and entrance examinations in the public schools of various cities, states and provinces. Poor sight, or lack of color perception, disqualifies from military service, and from that of the great railways; excludes the applicant alike from West Point and from the signal tower. For admission to our schools there is no selection. Defects that could be recognized by an entrance examination and corrected in the beginning, are increased under conditions of school life. This is, perhaps, a failure and a lifelong injury. School Hygiene was the subject of the President's address at the New Haven County meeting of the Connecticut Medical Society, in October, 1897. The closing recommendation was for entrance examinations. This address was published in the *JOURNAL* for December. The matter was favorably referred to the Legislative Committee at the annual meeting of our State Society in 1898. Little difference of opinion exists in the minds of physicians. If we may draw conclusions from current secular literature, from the newspaper and the magazine, the community will welcome a properly devised plan for the inspection of the eyes of the children admitted to our public schools; so that the desired laws can undoubtedly be enacted, if the medical profession of the state will co-operate with and support the Legislative Committee in their efforts at the next session of our Legislature.

* * *

IMMENSE strides have been made in the rational treatment of the insane since the day Phillipe Pinel struck the chains from eighty of his patients in the Bicêtre at Paris, so that to-day we have frequent occasion to discharge patients from our hospitals and asylums, either totally cured or well along the road of convalescence. A large percentage of these are at first in no condition to take their places once more in the

hard, busy competition of every day life. Some of the more fortunate ones, of course, receive from friends and relatives that care and attention necessary until the mental equilibrium is once more firmly established. But aside from these a number, and a goodly number, too, are compelled to shift for themselves from the very start of their new life. They may be compelled to meet once more the conditions primarily responsible for their mental state, long before they are able to cope with and overcome them. Left alone they soon drift into a condition of abject pauperism, a burden to themselves and a charge on the public.

In various Continental societies the after-care of these unfortunates is beginning to play almost as important a part as the first treatment aimed at relieving their mental condition. In Paris, Fabret, president of the administrative committee in the work of aiding indigent insane discharged from public asylums, reports that sixty-nine have been helped to positions.

In New York, at the recent national conference of charities, this after-care of the insane was discussed with much interest. Several suggestions were made, and among them "boarding-out." The unanimous opinion seemed to be that upon the state itself should fall the burden of this after-treatment. But there are numerous valid objections to this. Many of those who have studied the question think the state has already more than it can do in providing for the actually insane. The after-care, according to them, must be undertaken by benevolent institutions. Up to the present our country has certainly been remiss in the consideration of and action upon this subject, and we are glad to note that an active interest in the question is beginning to be shown. Much has yet to be done before this urgent need can be supplied, but by dissemination of information and enlistment of interest the subject will be better understood and practical, beneficial results may be looked for.

POSTPONEMENT OF THE THIRD PAN-AMERICAN MEDICAL CONGRESS.

INTERNATIONAL EXECUTIVE COMMISSION OF THE PAN-AMERICAN
MEDICAL CONGRESS.

OFFICE OF THE SECRETARY,
CINCINNATI, O., November 5, 1898. }

MY DEAR SIR:

I have the honor to announce that in April, 1898, I received from Dr. José Manuel de los Rios, Chairman of the Committee on Organization of the III Pan-American Medical Congress, a request that, in consequence of the then existing rebellion in Venezuela, no definite arrangements could be made at that time relative to the meeting of the Congress previously appointed to be held in Caracas in December, 1899.

The following communication relative to the same subject is just at hand:

CARACAS, September 25, 1898.

DR. CHARLES A. L. REED, *Secretary of the International Executive Commission, Cincinnati, Ohio:*

DEAR SIR:

After having sent my communication dated April last, I find it to be my duty to notify you that, although the considerations pointed out in it have already ended, our country has been scourged by smallpox which has taken up all our physicians' activities and time, depriving them of going into scientific works. And, as that state of mind of our people and government after such calamities as war and epidemic would greatly interfere with the good success of our next meeting, I beg leave to tell you, in order you will convey it to the International Executive Committee, that our Government and the Commission would be grateful to have the meeting which was to take place in Caracas in December, 1899, adjourned for one year later. I am, dear Doctor,

Yours respectfully,

[Signed]

The President,

DR. JOSÉ MANUEL DE LOS RIOS.

In accordance with the request of the Government of Venezuela, and of the Committee on Organization, the III Pan-American Medical Congress is hereby postponed to meet in Caracas in December, 1900.

For the International Executive Commission.

CHARLES A. L. REED,

Secretary.

MEDICAL SOCIETY REPORTS.

NEW LONDON COUNTY MEDICAL ASSOCIATION.—The semi-annual meeting of the New London County Medical Association was held at New London, Conn., October 6, 1898. After a few introductory remarks by the President, Dr. Nelson spoke of the most frequent disease met with in old people, viz., atheroma, giving as its cause, the deposit of urate of lime in the arteries from an inability of the kidneys to excrete this product. The activity of the organs depends somewhat upon the activity of the person. Excretion depends on the activity of the organs. Activity is at a low point in the aged, therefore the excretion of the waste products by the kidneys is less, and the arteries are diseased thereby.

Remedy: Keep up activity in the old as much as possible by exercise and stimulants. Strychnine and nitroglycerine were the remedies suggested. Dr. Witter said that a man's arteries were apt to tell his age better than his lips. When the arteries were diseased he thought the danger of rupture too great to advise much activity.

Dr. Barchard spoke of his experience with distilled water, but could hardly recommend it as of much value. Dr. Braton thought that disease in the old came from lack of stimulation of not only the kidneys, but also the skin and bowels. Dr. Braman recommended good feeding and particular attention to the bowels. He did not use stimulants to any great extent. When he did use them he did it more for their quieting than their stimulating properties.

Dr. Ferrin spoke of ext. cascarae sagradae fld. as a remedy *par excellence* in constipation of the old, which he considered one of the most frequent diseases which affected the old; also of the value of this drug in chronic rheumatism in doses of fifteen drops three times a day.

The subject of tablet medicines was then discussed. The consensus of opinion was that many drugs, such as camphor, nitroglycerine, etc. (volatile drugs), were worthless in tablet form unless the tablet was coated, but that a great majority of remedies could be used in tablet form.

HARTFORD COUNTY MEDICAL ASSOCIATION.—The semi-annual meeting of the Hartford County Association was held in the Hunt Memorial Building, Hartford, Conn., October 19, 1898. After the address of the President, Dr. James Campbell, the following essays were read:

Some points of Prophylaxis in the Volunteer Medical Service, Dr. John B. McCook. Operative Treatment of Procerentia Uteri, with report of cases, Dr. Charles E. Taft. Obituaries—Dr. P. M. Hastings, by Dr. M. Storrs; Dr. Henry Douteil, by Dr. George Clary. Oil as a Surgical Dressing, Dr. Everett J. McKnight. Gastrostomy, with report of case, Dr. Marcus M. Johnson. Relation of cases, Renal Calculi with operation, Dr. Melancthon Storrs; two cases of Bulbar Disease, Dr. Frederick T. Simpson.

NEW HAVEN COUNTY MEDICAL SOCIETY.—The semi-annual meeting of the New Haven County Medical Society was held at the New Haven House, October 27, 1898, and was called to order at 11 a. m. by President F. W. Wright, of this city. Delegates present from other counties were Drs. Whiton, Hartford County, and Curtis, Litchfield County.

Dr. J. S. Ely, of New Haven, was elected to membership.

The annual address was delivered by President Wright, his subject being, "The Diagnosis of some of the Common Eruptive Fevers."

The question up for discussion was "Typhoid Fever," and remarks were made upon it by Drs. C. A. Lindsley, Foote, Carmalt, Gilbert, Barbour, and Barnet. Dissertations were made by Dr. L. W. Bacon, of this city, upon Phymosis, and by Dr. E. W. Goodenough, of Waterbury, on Radical Treatment. Dr. Barbour followed, by request, with a paper upon the subject of "The Outlook for the Doctors," which had been previously read before the Waterbury Medical Society.

The meeting was temporarily interrupted at 2 p. m., and dinner was served. The session was resumed an hour later, at which time the Executive Committee tendered its report. The question recommended for discussion at the next meeting in April was "Albuminuria." The committee to report upon the above question is Dr. H. E. Smith, of New Haven, on "Functional Albuminuria;" Dr. J. D. McGaughey, on "Puerperal Albuminuria;" Dr. C. A. Tuttle, on "Prognostic Value of Albumen in Chronic Nephritis;" Dr. C. S. Rodman, on "Albumen in Life Insurance." For Dissertators, Dr. E. N. Smith, of Meriden; Dr. T. M. Cahill and Dr. R. E. Peck, of New Haven. For Standing Committees: 'Board of Censors,' Dr. C. S. Rod-

man, Dr. F. H. Wheeler, Dr. H. L. Swain. Credential Committee, Dr. F. G. Graves, of Waterbury; Dr. R. W. Pinney, of Derby. Committee on Biographical Sketches, Dr. John Nicoll and A. N. Alling, of New Haven. Committee upon Public Hygiene: Dr. F. P. Griswold, of Meriden; Dr. B. A. O'Hara, of Waterbury; Dr. E. C. Beach, of Milford. County Reporter: Dr. F. N. Sperry.

The Society then proceeded upon the election of officers with the results as follow:

President, Dr. O. T. Osborn, New Haven; Vice President, Dr. C. E. Munger, Waterbury; Clerk, Dr. Joseph H. Townsend.

The meeting, which was one of the largest, longest and most interesting meetings ever held by the Society, adjourned at 4.45 p. m.

NEW HAVEN MEDICAL SOCIETY.—The regular meeting of the New Haven Medical Society was held Wednesday evening, November 2, 1898. After the meeting was opened, Dr. Moody related a case of a man whom he was called to see for acute articular rheumatism in the knees, ankles and toes. The parts were tender, but not much swollen.

The patient had sweats and was unable to pass urine. He was catheterized constantly. The amount of urine was normal and microscopic examination showed no kidney disease. The day before his death he passed urine normally. From Friday until Monday he was given six grains of salycin every four hours, 4 grains of quinine bisulphate every four hours and 20 grains of bicarbonate of potash every six hours. On Monday he was given salycin every six hours and potash twice. After Sunday he had a systolic heart murmur, but no rise of temperature and appeared to be convalescing. On Wednesday morning he complained of being cool and was inclined to sleep. He took dinner in bed the same day, but after taking some soup felt faint. He was put upon his back for a time and soon felt well enough to finish his dinner. About 1:45 he began to be cyanotic, but his pulse and temperature were still normal. At 3 o'clock his temperature was normal, his pulse 84 and his respiration normal, but the cyanosis had increased. At 3:30 the doctor was called to see the patient, but just before his arrival the patient had vomited and become unconscious. There was no pulse at the wrist, but was 130 at the heart. Breathing was shallow, but still eighteen to the minute. Stimulation brought a pulse to the wrist, which was small, however. Patient died at 5:30 without regaining consciousness. An

autopsy revealed no organic disease except a rupture of the liver, which may have been ante-mortem or post-mortem. The liver had been punctured by the undertaker's instrument and the rupture may have been caused in a similar way. The heart valves showed no signs of inflammation.

Three causes of death are suggested: blocking of the coronary arteries; internal hemorrhage from the rupture of the liver. The brain was not examined, but there may have been a disorder there of the heart centers.

After a brief discussion of pneumonia the meeting adjourned.

The regular meeting of the New Haven Medical Society was held Wednesday evening, November 16, 1898. The meeting was called to order by President Townsend.

The subject for discussion was Gastric Dyspepsia. As a part of the discussion, Dr. Verdi related a case: A man, about sixty-five, who had had stomach trouble for about forty-five years, came to him complaining of pain in the stomach after taking food of any sort, and found it necessary to evacuate the stomach in order to get relief. He had been failing in health, and was much emaciated, but was not anæmic. Intestinal peristalsis was visible through the abdominal walls. There was diminished area of liver dullness, and the spleen was not palpable. His heart and lungs were sound and his stomach of normal size.

Pain came on about two hours after eating solid food and four or five hours after taking liquids. Nothing was done for him the first day. He was told to eat a roll and a quantity of water equal to 150 c. c. for breakfast the next morning. This was removed an hour and a half after taking, and the quantity then amounted to about 500 grams. It was acid to litmus and no lactic acid present, and the acidity was normal. The stomach was washed out daily for ten days, the patient having been put on a liquid diet, and at the end of this time patient had a desire for solid food. He was soon allowed solid food and rapidly gained flesh and was in good health for about four months when the attacks of pain returned. The same treatment was employed with good results, the patient recovering as he had after the previous treatment.

After a few remarks by other members the meeting adjourned.

The question for the next meeting is "The Prevention and Treatment of Laceration of the Cervix and Perinæum."

MEDICAL PROGRESS.

THE BACTERIOLOGY OF ACUTE RHEUMATISM.—(*Boston Med. and Surg. Journal*, Nov. 3.) Singer regards rheumatism as an infectious disease, classing it with others whose infectious nature is known as influenza, typhoid fever, etc. He regards as of some significance the occasional appearance of acute rheumatism epidemically, the transmission of the disease to the foetus by contagion, and the clinical course, so markedly resembling an infectious disease. He looks upon acute rheumatism as a haemic infection and a general disease, better designated as rheumatic fever. The affiliation of rheumatism with pyaemia is very strict, and is manifested by the existence of arthrites supervening by irregular attacks, by the intermittent febrile condition, the profuse sweats, the icterus, the peptonuria, the cardiac and ocular complications, the cutaneous manifestation. It belongs to the family of erysipelas, which sometimes alternates with it, and to that of osteomyelitis, which produces peri-articular oedema. From these reasons Singer concludes that the pathogenic agent of rheumatism may belong to the group of pyogens. Bacteriologists all agree that there exist pyogenic micrococci in the blood, the urine, the inflamed joints and the endocardial vegetations. These bacteria have not for their sole effect the production of pus, for they may give rise to a sero-fibrinous exudate. On the other hand, rheumatism is sometimes complicated by supuration of the joints. This writer, then, believes himself justified in considering as primary pathogenic agents in acute rheumatism the pyogenic cocci, which he has obtained in the living patient from the blood, urine and intra-articular exudate. The bacteria were found only in a fraction of the cases investigated. Those most constantly found were the staphylococcus pyogenes albus, streptococcus conglomeratus, and pyogenes. Singer affirms that the micrococcus may exist in the synovial membranes and tissues around the joint without being in the exudate. It secretes toxins which cause the swelling. He says his showing is as good as that of the pseudo-rheumatisms, in fact, in blennorrhagic arthritis the examination of the exudate does not give more frequent positive results.

AUTO-INTOXICATION.—(Dr. McCaskey, *N. Y. Medical Journal*, Oct. 22.) This is a toxic condition resulting from the chemical poisons formed either as an incident of tissue meta-

bolism or as products of bacterial growth in some part of the organism. During health the body is able to protect itself against these self-formed poisons in the following manner. The leucomaines are mostly destroyed near their seat of formation by the process of oxidation. Probably there are also processes of which we have no knowledge as yet, which aid in the conversion of toxic into non-toxic substances. The organism is protected from ptomaines, first through the destructive action of normal gastric juice on bacteria, the selective and transforming power of the intestinal epithelial cells, and the destructive action of the liver. After passing through the circulation these poisons are hurried to the kidneys and rapidly eliminated from the system and never reach an amount capable of producing disease. In addition to the ptomaines and leucomaines, bacterial toxins, the interstitial fluids of the germ-body and the pyogenetic proteids described by Buchner are responsible for the majority of cases of auto-intoxication. A case is related of profound anæmia with leucocytosis in which the patient showed symptoms of chronic intestinal disorder. Considering the leucocytosis the result of intestinal auto-intoxication, intestinal disinfection was accomplished, and at the end of three weeks the red cells were doubled in number and the leucocytes reduced to normal. The conditions in this case are thought to be dependent on pyogenetic or chemotactic proteids of Buchner or upon some bacterial products absorbed from the intestine and producing the leucocytosis. The remarkable regeneration of red blood cells seems to demonstrate the destructive influence which these or associated poisons exert upon the hematogenetic function. The fatty acids, butyric, lactic, etc., acetone and similar compounds are probably responsible for auto-intoxication at times. The clinical recognition of the toxæmias resulting from these substances is very difficult, as the symptoms are exceedingly diverse. Means for their chemical recognition and differentiation must be developed. Through these channels only will they be satisfactorily explained.

ANTITOXIN IN THE TREATMENT OF PNEUMONIA.—(*Am. Journal of the Med. Sciences*, Oct.) Dr. A. H. Smith, of New York, gives a brief review of the progress of sero-therapy in the treatment of pneumonia and concludes as follows: "We cannot avoid the conclusion from this resumé of the achievements of sero-therapy in its application to pneumonia, that, up to the present time, it can scarcely be said to amount to more than an encourage-

ment to further effort. No really decisive results have been obtained. In some cases the effect seems to have been favorable, but it is impossible to assign to the injections any positive share in the result. The difficulties in the way of extended investigation are such as to deter most experimenters from pursuing the subject. The first difficulty is found in the short life of the coccus. Cocci which were virulent at the beginning cease to be so as the investigation proceeds. On the other hand, toxins which were expected to display only a moderate reaction when injected sometimes produce most unlooked-for results. Animals apparently progressing normally toward immunity most unexpectedly succumb to a dose of toxin supposed to be entirely within their limits of safety. Again, animals that were readily immunized at first, lose their immunity in spite of renewed inoculations and the serum from them ceases to be reliable. This variation in the conditions under which experimentation is conducted is liable to vitiate the most carefully drawn conclusions. If this is true under the favorable circumstances of the laboratory, what must it be in the exigencies of private practice? If, before employing a therapeutic agent, we must resort each time to experiment to test the value of the specimen in hand, the usefulness of the agent will be very limited. Washbourne, of Guy's Hospital, has devised a method of producing anti-pneumonic serum, essentially that in use for the production of diphtheria antitoxin, by which he claims his preparation can be kept for sixty-six days without deterioration, and he can produce accurately standardized preparations. It is to be hoped that this method will overcome some of the difficulties in the use antitoxin and that it will be possible in the near future to command a supply of reliable antitoxin for the treatment of pneumonia, as we already do for the treatment of diphtheria. Efforts to produce such a supply are now being made by the Health Board of New York. Should they be successful, the value of the method will soon be determined."

MEDICO-LEGAL VALUE OF THE X-RAY.—Dr. G. H. Stover (*Phil. Med. Journal*, Oct. 15, 1898) states that the various methods of X-ray examination do not give absolute and correct information as to the conditions present. He questions the propriety of the introduction as evidence of information, gained by the use of the X-ray, regarding pathological or normal conditions in the human anatomy, and especially concerning the propriety of exhibiting skiagrams to juries. The function of the X-ray is only an auxiliary to the physical examination by

visual inspection. But by direct visual inspection of a body situated favorably for such view we gain much more complete information than is given by the X-ray of a body in a situation unfavorable for direct inspection, and the X-ray is at a further disadvantage, as compared with ordinary light, in that it cannot act directly upon the retina, but must act by means of intermediate processes, recording itself upon the sensitive plate of the fluorescent screen, the image thus formed being translated for appreciation by the retina by means of chemicals or fluorescent light. By the X-ray we are shown only the shadow-profile of a substance which is not situated favorably for direct inspection. It does not give indication of the color, texture, thickness, weight or chemical nature of the investigated substance, as would be demanded of perfect evidence. It cannot be expected to give full information of the shape, even, of a hidden body. The one chief thing shown by the X-ray is the opacity or transparency to these rays of the investigated substance. By means of certain manipulations the location of the substance is also made out. It will thus be seen how very limited is the province of the X-ray. If the skiagram is given to the jury for inspection, it must be accompanied by the results of other methods of examination, together with the expert opinion based upon these examinations, and the skiagram must be understood to be only a part of the examination.

HOSPITAL AND CLINIC NOTES, ETC.

TRAUMATIC EPILEPSY—OSTEO-PLASTIC RESECTION OF THE SKULL WITH APPARENT RECOVERY OF PATIENT.—*G. E. Brewer, M.D., New York.*—George S., aged about 18, applied at the City Hospital, New York, on July 18, for treatment. The patient stated that two years before, he had been kicked in the head by a horse. As a result of this injury he was unconscious for a short period, but later regained consciousness, and resumed his occupation. Some time after that he was seized with an epileptic convulsion. This was shortly followed by other convulsions of a similar nature, which have gradually increased in frequency until the patient has been obliged to give up his work. When admitted to the hospital he was having about two attacks each week. These were described by

those who observed them as beginning with convulsive movements, limited at first to the muscles of the left arm and leg, then rapidly extending to all the voluntary muscles of the body. The frequency of these attacks was considerably increased as the result of mental excitement or any unusual physical or mental exertion.

On examination of the head a depressed area of bone was clearly seen, occupying a position a little anterior to the middle of the right parietal region. Upon pressure at the site of this depression epileptic attacks would be produced, similar in character to those which occurred spontaneously.

OPERATION.—On July 26, under ether anæsthesia, an operation was performed by Dr. George Emerson Brewer, attending surgeon to the hospital. An omega-shaped incision was made over the parietal region, including the area of depressed skull. The bone was chiseled through in the line of the cutaneous incision, and a horse-shoe flap, consisting of bone with the detached soft parts, was raised. Corresponding to the external depression was found a fracture of the inner plate of the skull, with a depressed spicula of bone pressing upon the dura mater near the arm centre of the brain. This was removed without opening the dura, the bone flap replaced, skin sutured, and an aseptic dressing applied. Primary union occurred, and the patient has since that day had no recurrence of the epileptic seizures or other cerebral symptoms.

If this case continues well for a period of two years from the date of operation, it may fairly be regarded as a cure.

ACUTE GLAUCOMA SUPERVENING UPON CHOROIDITIS DISSEMINATA PERMANENTLY RELIEVED BY IRIDECTOMY.—*David Webster, M.D., New York.*—Doctor R. P. G., aged 58, married and practicing in New York, happening to be in my office on November 21, 1880, asked me to examine his eyes, not that he had ever been conscious of any visual defect or any difficulty in the use of his eyes, but because it happened to be convenient. I found that, unaided by glasses, each eye had vision $\frac{20}{100}$, and that, on correcting his hypermetropia with glasses $+\frac{1}{4}$ the vision of each was brought up to $\frac{3}{8}$ — (nearly normal). On making an ophthalmoscopic examination I was surprised to find that he had well marked disseminated choroiditis in both eyes. He had glasses, $+\frac{1}{12}$, with which he read comfortably. I prescribed glasses, $+\frac{1}{12}$, for distance vision. On November 21, 1881, he consulted me on account of a subconjunctival ecchymosis which

covered the nasal third of his right eyeball, and which showed itself one morning after sitting up late the night before at a Masonic entertainment and drinking several glasses of lager beer. This disappeared in a few weeks under hot water bathings. I next saw the patient on October 22, 1886, when he complained of lachrymation while out of doors in damp or windy weather. On fine days and in the house he was not conscious of any trouble with his eyes. R. V. = $\frac{2}{10}$; no improvement with glasses, L. V. = $\frac{2}{10}$; made $\frac{3}{10}$ — with + $\frac{1}{8}$.

The ophthalmoscope showed no other lesion than choroiditis disseminata heretofore noted.

On February 10, 1887, he said that he had observed that his field of vision had been gradually contracting for a month or two.

R. V. = $\frac{2}{10}$ +; no improvement with glasses.

L. V. = $\frac{2}{10}$ +; made $\frac{3}{10}$ with + $\frac{1}{8}$.

The right visual field was considerably contracted, and the ophthalmoscope showed that the right optic disk was atrophic and slightly cupped. Pilocarpine was prescribed to be used *pro re nata*. On April 6, the right eye had lost all perception of light; glaucoma simplex and atrophy of the optic nerve having supervened upon his old disseminated choroidal atrophy.

On March 28, 1888, nearly a year after his last visit, he came to me with acute glaucoma of the right eye. The eye had been red for three or four days; there was deep circumcorneal injection; the tension was much increased; the anterior chamber was shallow; the pupil dilated, but not quite circularly. He had suffered comparatively little pain. Ether was administered and a broad, clean iridectomy was done upwards. The eye operated upon was bandaged and the other was protected by a shade.

March 29—The patient rested well, no pain, tension normal.

April 3—The patient was discharged with the eye feeling well and and the redness subsiding.

April 23—R. V. = 0. L. V. = $\frac{3}{10}$ with his glass.

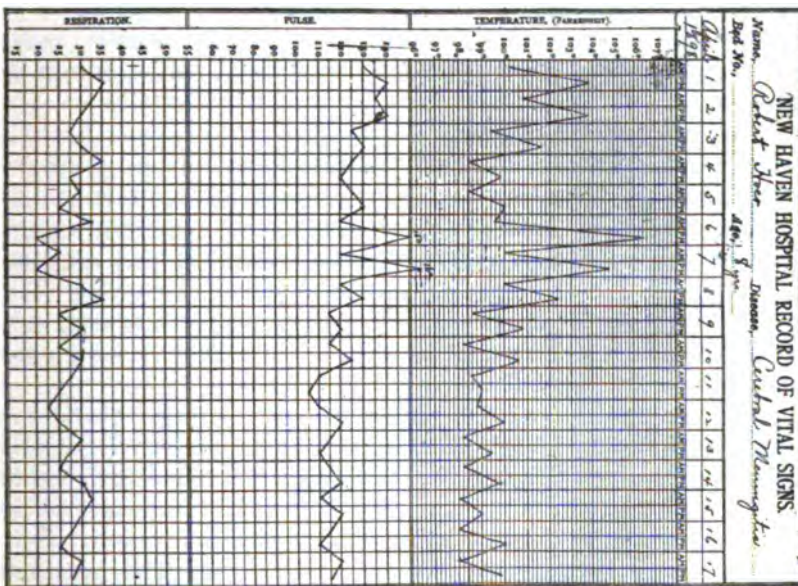
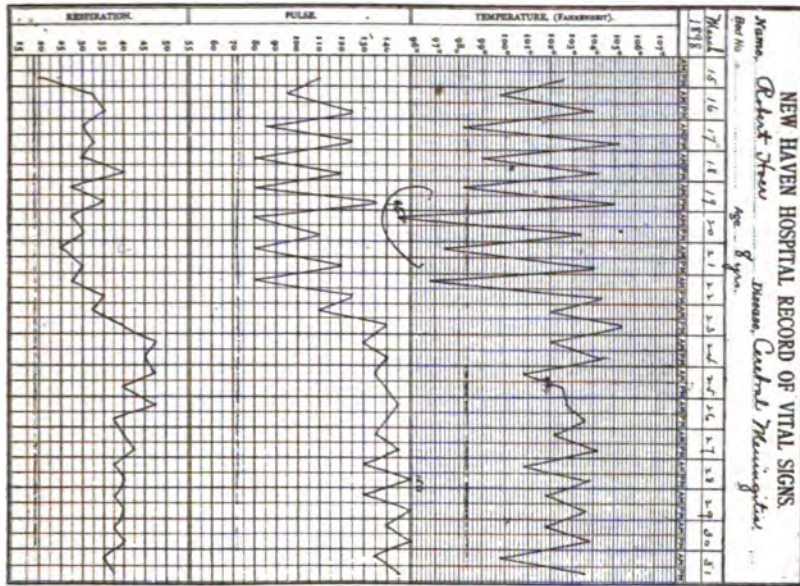
The patient died of pneumonia on December 27, 1893, aged 71, more than five years after the operation. The blind eye had given him no further trouble and he saw well with his left eye up to the time of his death.

While diseases of the choroid are universally recognized as an important factor in the etiology of glaucoma, I am unable to recall, in my own experience, any other case in which glaucoma supervened upon disseminated choroidal atrophy of long standing.

A CASE OF CEREBRAL MENINGITIS WITH CHARTS.—The patient, a boy 8 years of age, was admitted to New Haven Hospital, March 15, 1898. The previous history was as follows: He had had malaria for several summers past, and five days previous to entrance he suffered from severe headache. There were no prodromal symptoms. That night his head was drawn back and to the left, but next day it was between the shoulders. The patient was somewhat feverish, but there was no delirium. The extension of his head became constant. There was considerable frontal headache, but no tenderness or pain over the spine. His voice was thick and his jaw easily moved. He swallowed well and his tongue was slightly coated. Temperature 102.5°, pulse 110, respiration 21. There were no twitchings, spasms, or convulsions; no vomiting, middle ear disease, paralysis or endocarditis. The urine was normal. Examination of the heart, lungs and abdomen was negative.

March 15, quinine sulphate and a milk diet were ordered. Patient became restless, and thirsty, and had a chill followed by marked perspiration. From March 16 to 20 about the same conditions existed, though all were increased in intensity. On the morning of the twentieth the temperature was subnormal, 95.2°. The quinine was stopped, and bromides with small doses of spiritus frumenti were administered. Sponge baths were given when the temperature rose above 104°. During the four days following the twentieth, the patient was sleepless, irritable, and continually cried out with pain. There were involuntary urination and defecation. The head was retracted but the mental condition was perfect. Took nourishment and medicines well. Potassium iodide was now started, $\frac{1}{2}$ gm. every two hours, and was increased on the 25th, to 1 gm. every two hours, and all other medication stopped. Pulse weak, and respirations shallow and numbered 40-50 to the minute. March 26, the potassium iodide was increased to $1\frac{1}{2}$ gm. every two hours, making 270 grains in 24 hours. The patient was now comfortable but growing weaker. At times he became restless and at night had severe frontal headache with occasional spells of delirium. On April 1, the patient was screaming with pains in the head. He became delirious, pulse rapid and scarcely perceptible. Nourishment and medicines were taken with difficulty, and inunctions of Hg. were employed.

The crisis came on the sixth; pulse could not be counted and the temperature was 106.4°, though consciousness was generally present. The baths were omitted. Cheyne-Stokes respiration was observed and death was expected. But on the



CHARTS OF A CASE OF CEREBRAL MENINGITIS.

seventh his condition was improved; slept well and was very bright. From the eleventh of April until the seventeenth the temperature, as can be seen on the accompanying charts, ranged between 98° and 100°; the pulse was rapid but strong; and respirations deep and regular. Evacuation of the bowels and bladder were no longer involuntary; headache and retraction of the head decreased. Though the patient was emaciated the convalescence was rapid and uneventful.

It is interesting to note that the iodides were given for 25 days, 270 grains per day, yet there were no symptoms of poisoning except a slight rash on the arms which lasted but a few days.

DOUBLE INFECTION OF TYPHOID AND MALARIA, WITH CONCURRENT JAUNDICE.—A male patient, 26 years old, was admitted to the New Haven Hospital, August 22, having come from Camp Wickoff. He was a soldier, and gave a history of feeling perfectly well during his stay in Cuba, being first taken sick on board the St. Louis, several days after leaving Santiago. On arriving at the hospital he had a high fever and was in a very depressed condition, but up to this time had no chills. His skin was of the most intense yellow hue, and the conjunctiva deeply injected. This discoloration of the skin suggested jaundice, but none of the other symptoms were, however, present. The patient was also thought to be suffering from malarial fever, which opinion was substantiated by finding the plasmodium in the blood.

Four days after entering the hospital the patient became delirious, temperature reached 104°, and roseola spots appeared upon the body; diarrhœa was also present and a diagnosis of typhoid fever was made, and was confirmed by obtaining the Widal reaction. Small multiple abscesses developed all over the body, and two large axillary abscesses appeared. The typhoid fever, after running a somewhat atypical course subsided, to be followed by another attack of malaria, in which the plasmodia were again found in the blood.

The treatment was for the most part symptomatic, the typhoid symptoms were treated as they developed, ice cold sponging being used when the temperature reached 103°; much cardiac stimulation being also required. The malaria was of the tertian variety, chills occurring every other day. Both attacks were effectually combatted by quinine. The jaundice gradually disappeared, the patient became convalescent and was discharged November 9, apparently well, after an illness of eleven weeks.

This case is extremely interesting, showing, as it does, a clear case of double infection with typhoid fever and malaria, with concurrent jaundice.

The Board of Managers of the New Haven Dispensary held their annual meeting on November 9. The report of the Secretary, Dr. B. Austin Cheney, showed a great increase in the number of patients treated during the past year. The average per day was 53, and the total number treated 16,217; while the average number of prescriptions dispensed per month amounted to 1,598. According to nationality, there were treated: Americans, 1,221; Russians, 1,218; Irish, 1,131; Italians, 357; Germans, 246; and many from other countries. The Board finds itself seriously handicapped on account of the increased amount of work which is carried on without a corresponding increase of the funds contributed.

The officers for the ensuing year are as follows: President, Dr. Charles A. Lindsley; Vice President, Thomas Hooker; Secretary, Dr. B. Austin Cheney; Treasurer, Edwin L. Chapman; Committee on Finance, Max Adler, J. S. Hotchkiss, Thomas Hooker; Committee on Supplies, B. Austin Cheney, *ex-officio*, William H. Carmalt, Louis S. DeForest; Attending Physicians, Henry Fleischner, M.D., William H. Carmalt, M.D., B. Austin Cheney, M.D., Henry L. Swain, M.D., Louis S. DeForest, M.D., Arthur N. Alling, M.D., John S. Ely, M.D., and R. E. Peck, M.D.; Consulting Physicians, Francis Bacon, M.D., Charles A. Lindsley, M.D., O. T. Osborne, M.D., and C. J. Foote, M.D.

Dr. J. S. Ely has been made chief of the medical clinic, and Dr. L. S. DeForest chief of clinic for children. These, formerly combined, are now separate departments. Drs. A. G. Nadler and W. N. Winne have been appointed assistants in pediatrics, and Dr. D. R. Hinckley in the medical clinic. Dr. Hinckley has also been made assistant to Dr. C. D. Phelps in physical diagnosis.

Since the opening of the fall term the Senior and Junior classes of the Yale Medical School have witnessed the following operations, which were performed at the New Haven Hospital by Doctors Carmalt, Russell and Hawkes :

Oct.

3. Endometritis, cure.
4. Recurrent sarcoma of orbit, improvement.
5. Cyst of broad ligament, died.

Oct.

8. Dislocation of humerus, cure; inguinal hernia, cure; hyperthrophy of prepuce, cure.
9. Cancer of cervix, cure.

Oct.

10. Fistula in ano, cure.
11. Phimosis (congenital), cure; cancer of breast, cure.
13. Imperforate anus, improvement; laceration of perineum, laceration of cervix and fissure in ano, cure; laceration of cervix and perineum, cure; dislocation of humerus, cure.
15. Laceration of cervix and perineum, cure.
16. Stricture of urethra, cure.
18. Comp. fracture of forearm and rupture of radial art., cure; appendicitis and septic peritonitis, died.
19. Tumor alba, improvement; genu varum, cure; bullet wound orbit, improvement; varicocele, cure.
20. Ovarian cyst, cure.
22. Fistula in ano, cure.
26. Hæmorrhoids and fissure in ano, cure; fistula in ano, improvement.

Nov.

27. Femoral hernia, cure; appendicitis and tubercular peritonitis (not recorded).

30. Appendicitis, cure.

Nov.

1. Incised wound of finger, cure.
2. Recurrent cancer of breast.
3. Intestinal obstruction, cancer of colon, died.
5. Cystocele and lac. of perineum.
6. Cyst of coccyx, cure.
7. Rupture of intestine, died.
9. Cystic sarcoma of kidney, growth too extensive to be removed; tubercular glands of the neck.
10. Gangrene of leg; cancer of tibia, inguinal and pelvic glands greatly enlarged; crush of thumb, amputation.
12. Tubercular submaxillary gland, adenectomy.

ITEMS OF INTEREST.

By request of Surgeon-General A. M. Phillips, Dr. Herbert E. Smith has recently made a report on the Niantic camp water supply. From this it appears that the wells in the southern part of the camp are practically normal, that those on Line Officer street, along which the troops were encamped, are of good organic and bacteriological purity, but show distinctly in other data of the analysis the contaminating influences of the encampment. This is shown even more clearly in some of the mess house wells where the tests for bacteria and organic matter show that the pollution of the soil has exceeded its purifying power. In none of the wells was the contamination a gross one. The absence of coli bacilli in all the wells examined, and a study of the possible sources of contamination led to the conclusion that such contamination as existed did not come from the privies, but rather from the mess house drains, and from surface pollution about the tents. These conclusions do not tend to fix the responsibility for the typhoid fever on the water as against other sources of infection in the camp and village, but neither do they prove that the water was not a source of infection, for

clearly it is entirely possible that some one of the wells may have been infected temporarily. The analyses do show clearly that the soil of the camp is contaminated, and Dr. Smith states his belief that this contamination is cumulative in character, and that the present water supply will deteriorate rather than improve. He also states it as his belief that it is wrong in principle to use a ground water supply drawn from the site of a population as dense as that of the camp ground during an encampment, and for these reasons he strongly recommends that a new source of water be secured from without the camp.

Dr. William Osler has succeeded Dr. William H. Welch as Dean of the Johns Hopkins Medical School.

In twin pregnancy the maternal mortality is more than double that of single pregnancy.

Since September 1, 1898, there have been fifty-five major and seventeen minor operations at the New Haven Hospital.

Germany's proportion of suicides is larger than that of any other European country.

In Sweden and Norway a legal marriage is not allowed to be solemnized until both parties produce certificates attesting that they have genuine vaccination marks.

Dr. A. J. Turner of England mentions the finding of a dislocation of the sternal end of the right clavicle occurring at childbirth. Though this is a very rare case, yet it is well for a physician to bear in mind the possibility of such an accident.

Dr. Robert Jones of Liverpool in the *British Medical Journal*, November 5, gives an account of the removal of the testes in seven cases of enlarged prostate, with unfailing decrease in size of that organ, and remarkable improvement.

In Capt. R. S. Woodson's (surgeon of the regular army) report to General Wood, November 4, 1898, is an account of 5,000 cases of smallpox at Holguin and its vicinity, and several hundred at Gibara. The disease has continued uninterruptedly for three years, the Spanish and Cuban authorities making little intelligent effort to overcome it. The form of the disease is most malignant and recoveries are few, the unhygienic modes of living probably helping to increase the mortality.

The dry air treatment of pauper patients afflicted with tuberculosis of the lungs began at the New Charity Hospital at Dunning, Chicago, November 1, 1898. The institution will accommodate 450 patients, and the object is to reproduce as nearly as possible the climate of Arizona and New Mexico.

There has been considerable alarm in Berlin owing to the plague at Vienna, and the government has announced that no experiments similar to those which led to the outbreak at Vienna shall be allowed in the Berlin laboratories.

A German army surgeon states that in a large number of "sprains" of the ankle joint the Roentgen ray shows that in a majority of cases there is actually either fracture or dislocation of some one or more of the smaller bones. The treatment should be fixation in order to prevent false joints, exostoses, etc., leaving permanent impairment of function.

Ether drinking is said to have increased enormously throughout portions of Russia of late years, and the habit, from a social point of view, is held to be a far greater evil than that of alcohol. It seems to have an equally powerful hold upon its victims and is very deleterious to health.

A post-mortem of the murdered Empress of Austria has shown that the blow of the assassin broke the fourth rib, the weapon piercing the lung and the left side of the heart and penetrating three and one-third inches. After being stabbed the Empress walked to the steamer, a distance of fifty yards, and it was only after reaching the vessel that she fell. The wound in the heart muscle was only a sixth of an inch in length and the elasticity of the myocardium partially closed this and prevented an immediately fatal hemorrhage.

The annual meeting of the New York State Association of Railway Surgeons was held in New York City, November 16. A special feature of this meeting was a discussion of the various medical and surgical systems in vogue on the railways of the United States. Papers were read by the lay officers of the different roads and discussed by the surgeons.

There has been recently opened in the Institute for Infectious Diseases at Berlin a department for the treatment of hydrophobia by Pasteur's method, and for scientific research on the subject of hydrophobia. This is the first establishment of its kind in Germany.

The secretary of St. Luke's Hospital for the Insane in London gives it as his opinion, based upon experience gained from many years' contact with lunatics, that the most frequent cause of insanity is overwork, particularly any prolonged form of labor of a monotonous kind.

The Committee of the Connecticut Medical Society gave the following questions to the candidates for examination for the

privilege of license to practice in the State of Connecticut. The examinations were held November 8 and 9, 1898. Each candidate was required to choose eight out of the questions on each subject:

PHYSIOLOGY.

1. What is collateral circulation?
2. Give the boundaries of the fourth ventricle.
3. Give the coatings of the arteries and their histological structures.
4. What are the ferments of the intestinal canal and their functions?
5. What are Peyer's patches and the solitary glands?
6. What are the ordinary constituents of the human urine?
7. What is the composition of the human blood?
8. Describe the structures comprised in one of the pyramids of the kidney.
9. Draw a diagram illustrating the refraction of light by the crystalline lens.
10. By what structures is sound communicated to the brain?

ANATOMY.

1. Describe in detail the action of each of the three portions of the elbow joint.
2. Name the muscles of the internal femoral region.
3. Describe the pulmonary veins, stating in detail their peculiarities of function, structure and relation.
4. Describe the floor of the fourth ventricle.
5. Locate in the cortex of the brain the center for movement of the right leg and foot.
6. Describe the radial artery, and name its branches in the forearm.
7. Locate and describe the antrum of Highmore.
8. Describe the structure of the prostate gland, and state what facts are of special significance in its surgical anatomy.
9. Describe three varieties of normal human cæca, giving diagrams.
10. Name the coverings from without inward of an oblique inguinal hernia which has passed through the external ring.

OBSTETRICS.

1. Give the anatomical relations of the right ovary.
2. Describe the formation of the corpus luteum.
3. Describe the structure of the uterine body.
4. Name and describe the varieties of uterine myomata.
5. What are the indications for podalic version?
6. What is the anatomical structure of the umbilical cord?
7. What is the etiology of Phlegmasia dolens?
8. Describe the methods of performing perineorrhaphy.
9. Describe the symptoms and course of a mild septicaemia.
10. What is the etiology of Spina bifida?

SURGERY AND PATHOLOGY

1. What is the pathology of senile gangrene?
2. How would you do a Gastro-enterostomy?
3. How would you control the hemorrhage in amputation of the shoulder joint?
4. Differentiate between fracture of the neck of the femur and dislocation.

5. Describe the operation for strangulated indirect inguinal hernia and give the coverings.
6. What bacteria do we find in appendicitis?
7. What disease may be taken for appendicitis, and give differential diagnosis?
8. What is the difference between caries and necrosis?
9. How would you treat otitis media chronica?
10. Give the landmarks for operation of ligating the femoral artery.

CHEMISTRY AND HYGIENE.

1. If an application of nitrate of silver were acting too powerfully, how would you modify its action by a chemical to be found in any kitchen? What is the chemical reaction?
2. Give the chemical formula for Sodium Hydrate.
3. Fully describe two reliable tests for albumen in urine.
4. Name the chemical constituents of human bile.
5. How is circulating arterial blood changed by carbon monoxide? How by carbon dioxide?
6. State the culture and staining tests necessary to differentiate the Klebs-Loeffler bacillus from any known organism.
7. How would you determine the virulence of any pathogenic micro-organism?
8. Fully describe one natural and one artificial way of rendering water contaminated by pathogenic micro-organisms safely potable.
9. What is the period of incubation of smallpox and vaccinia respectively? How would your knowledge of this influence your practice when persons unprotected or partially protected by a primary vaccination are exposed to the infection of smallpox?
10. Describe and compare the advantages of the chief modes of disinfection now in use.

PRACTICE, PATHOLOGY AND DIAGNOSIS.

1. Give the clinical history of acute endocarditis and its sequelae.
2. What is the etiology and pathology of apoplexy?
3. Differentiate between locomotor ataxia and alcoholic neuritis.
4. Give the symptoms of catarrhal jaundice.
5. Pathology of broncho-pneumonia.
6. Differentiate intestinal from renal colic.
7. What is the diagnostic value of the tongue in disease?
8. What are the causes of difficult respiration?
9. What are the symptoms of measles?
10. Diagnose dilatation of the stomach.

MATERIA MEDICA AND THERAPEUTICS.

1. What is the physiological action of caffeine?
2. Give the symptoms and treatment of carbolic acid poisoning.
3. Compare the action of hydrochloric, sulphuric and nitric acids.
4. What are the therapeutic uses of nitrate of silver?
5. Give the doses of nitroglycerine, atropine-sulphate, aconitine, hyoscine hydro-bromate, oleo-resin of male fern, chloroform, corrosive sublimate, tartar-emetic, hydrocyanic acid and resorcin.
6. Give the actions of the preparations of ammonia and their therapeutic uses.

7. What is the treatment of smallpox?
8. What agents are used for the reduction of fever, and how are they applied?
9. What therapeutic measures would you use in chronic bronchitis?
10. Write a prescription in Latin, without abbreviation, containing four ingredients to be used for a nerve tonic, and give the reason for the use of each ingredient.

Questions given by the Committee of Connecticut Homœopathic Medical Society for a state license:

SURGERY.

1. Give the arguments for and against the use of plaster of Paris in the treatment of fractures.
2. What fractures might you have at the shoulder and how would you distinguish between them and dislocation?
3. How would you discriminate between fracture of the skull, concussion of the brain, apoplexy and alcoholism?
4. What are the surgical procedures for the treatment of retroversion of the uterus?
5. Name the different anesthetics and state what are the advantages and disadvantages in the use of each.
6. Differentiate between abscess, carbuncle and boil.
7. Discriminate between hernia, hydrocele and orchitis.
8. What are the causes of obstruction of the bowels and what measures for relief should be employed?
9. What is the common cause of abscess near the rectum and what procedure is necessary to obtain permanent cure?
10. Give your reasons for and against operating for appendicitis. How long it is safe to wait before operating?

OBSTETRICS AND GYNECOLOGY.

1. Name the articulations of the pelvis.
2. What is understood by "false pregnancy?"
3. Name the varieties of extra-uterine pregnancy according to the location of the ovum.
4. What would you do if called at term because the membranes ruptured and no other signs of labor appeared?
5. What would lead you to produce an abortion?
6. What is a labor pain?
7. What would you do if severe after pains persisted?
8. What directions do you give the nurse relative to the breasts of the newborn child?
9. How would you differentiate between retro-version of uterus and fibrous tumor?
10. What is hysterectomy? and how performed?

PHYSIOLOGY.

1. Describe the normal heart sounds and state how they are produced.
2. Give the structural differences between arteries, veins and capillaries, in the light of their physiological action.
3. How would digestion be affected were the ductus communis choledochus affected?
4. What is the composition and function of gastric juice in man?

5. Give the physiology of blushing, pallor and tear shedding.
6. Explain the contraction and dilatation of the pupil.
7. What is the function of the gray matter of the brain?
8. What are the functions of the spinal cord?
9. State the source and uses of lymph.
10. Describe the physiology of the excretion of urine.

MEDICAL CHEMISTRY AND HYGIENE.

1. What is the chemical reaction of normal (a) gastric juice, (b) pancreatic juice, (c) saliva, (d) bile, (e) blood, (f) urine?
2. Give in detail a test for sugar in the urine.
3. How do chemical antidotes and physiological antidotes differ in action? Illustrate.
4. State the composition of normal urine.
5. Give in detail two tests for albumin in urine.
6. How do you determine the total amount of solids in urine?
7. What directions should be given to a patient with phthisis in order to minimize the danger to others?
8. How should a case of typhoid fever be managed in order to prevent the infection of others?
9. How long should a case of diphtheria be isolated, and what determines the length of the isolation?
10. State your views on vaccination and revaccination.

ANATOMY.

1. Give the names and relations of the bones of the foot.
2. Describe the knee joint.
3. How is the arm attached to the thorax?
4. Give the attachments and uses of all the muscles of the arm above the lower third of the humerus.
5. Describe and give relations of the bladder and urethra, male and female.
6. Give the course and principal branches of the descending aorta.
7. Describe and give the contents of the popliteal space.
8. Give the number, foramen of exit and distribution of the facial nerve.
9. Describe the blood supply of the hand.
10. Describe the kidney and its duct, giving its location, attachments, size, shape, divisions and blood supply.

PRACTICE, INCLUDING PATHOLOGY AND DIAGNOSIS.

1. Into what two great classes may epilepsy be divided, and what are their pathological conditions?
2. Give the pathology of acute pericarditis.
3. Give the pathology of adenoid vegetations of the vault of the pharynx.
4. What are the symptoms that accompany adenoids in children and what is the treatment?
5. Diagnose a case of acute enteritis.
6. What are the indications for three leading remedies in cholera morbus?
7. What are the symptoms, subjective and objective, of acute lobar pneumonia in the second stage, and how would you differentiate it from pleurisy with effusion?
8. What is the cause and what are the symptoms, subjective and objective, of diphtheria?

9. What remedies would you give in the teething diarrhoea of infants?
10. What are the symptoms of spasmodic croup, and how would you differentiate it from membranous croup?

MATERIA MEDICA AND THERAPEUTICS.

1. What Homoeopathic remedies are most frequently indicated in threatened abortion? Give indications for their employment.
2. How would you effect rectal alimentation?
3. Name two leading remedies for chorea and give indications for their use.
4. Give symptoms calling for the following drugs in diarrhoea: Aloes, China, Podophyllum, Sulphur, Croton Tiglium.
5. How would you recognize opium poisoning and what treatment would you adopt in such a case?
6. How would you treat a case of Iritis? Give indications for two remedies.
7. Give the indications for Kali Bichrom. and Hepar Sulph. in laryngitis.
8. Give some of the chief indications for Apis.
9. Describe the chill, fever and sweat of Eupatorium perf.
10. Describe the headache of Iris, of Nux vom. of Belladonna, of Cimicifuga.

 OBITUARY.

Ex-1867.—Abraham H. Robinson, A.M., M.D., died at his home in Concord, N. H., on November 10. He was born in Concord, in 1813, and graduated from Yale in 1835. He pursued his medical studies in Yale and Dartmouth. Dr. Robinson had been President of the Center District and New Hampshire Medical Societies and twice represented the town of Salisbury in the state Legislature. During the war of the Rebellion he served in the army as surgeon.

 ALUMNI AND SCHOOL NOTES.

The first lecture of the year under the auspices of the Alumni Association of the Yale Medical School will be delivered by Prof. Lewellys F. Barker, M.B., of Johns Hopkins University, in Osborn Hall, Thursday evening, December 15, 1898. The subject will be Nervous Anatomy.

The second lecture of the Yale Medical Alumni Association will be given after the Christmas holidays. The speaker will be Prof. Samuel Alexander, of the Cornell Medical College of New York City. His subject is "Disease of the Prostate Gland."

John S. Ely, M.D., was elected to membership of the New Haven County Medical Society at its last meeting, October 27, 1898.

Superintendent Starkweather of the New Haven City Hospital fell from a car in Montclair, N. J., sustaining a transverse fracture of the patella. He was recently removed to this city and is doing well.

Dr. C. L. Kilbourne, '97, completed his course of service at the New Haven Hospital November 15. Dr. E. T. Smith, '97, thus became House Surgeon, Dr. P. D. Littlejohn, '97, House Physician, Dr. F. P. Heery, '98, Assistant House Surgeon, Dr. L. B. Porter, '98, Assistant House Physician.

'61—Dr. G. A. Shelton is traveling in Europe, recuperating from a severe nervous shock received last summer.

'91—Dr. Richard W. Westbrook has moved his office in Brooklyn to the "Imperial," on the corner of Bedford avenue and Pacific street.

'91—Dr. H. A. Elcock has been appointed Pathologist by the United States Government, to do duty at Chicago.

'93—Dr. E. W. Goodenough, of Waterbury, Conn., read a carefully prepared paper at the semi-annual meeting of the New Haven County Medical Society. His subject was "Radical Treatment."

'94—Dr. E. L. Kingman, having been in South America for several years, will return North for the purpose of pursuing some special work in medicine.

'94—Dr. E. S. Moulton sailed November 28, 1898, for Zaruma, Ecuador, to accept the position of surgeon to the South American Development Company. He expects to return to New Haven in June, '99.

'96—Dr. S. H. Wadhams, now on duty as acting assistant surgeon to the Nineteenth Infantry, U. S. A., at Ponce, Porto Rico, has been sick in the officers' hospital in Ponce, but is now well again and able to perform his regular duties.

'97—Dr. F. I. Nettleton has opened an office in Shelton, Conn.

'97—Dr. A. E. Loveland has recently been appointed interne at the McLean Hospital for the Insane at Waverly, Mass.

'97—Dr. A. L. Howard is pursuing a course of study in Edinburgh.

'97—Dr. T. D. Pallman, who has been pursuing special medical studies in Germany, expects to return to America within a few months.

Ex. '97—Dr. L. H. Stewart has been very sick with typhoid fever at his home in West Haven. He is now well on the road to recovery.

'97—Dr. J. E. Herrity has received an appointment to the house staff of the Polyclinic, New York.

'97—Dr. John A. Lee completed his service at St. Mary's General Hospital, Brooklyn, on October 1, 1898. He is now at St. Mary's Maternity Hospital, and on completing his course there, January 1, will begin the practice of medicine in Brooklyn.

'97—Dr. W. S. Barnes has recently opened an office at the corner of Howard avenue and Spring street.

'97—Dr. Sanford J. Ferris, who is now at the Columbus Hospital, New York, has accepted a position in the New York Maternity Hospital, his duties to begin January 1.

'97—Dr. A. J. Brocksieper, who recently opened an office in New Britain, has just returned from Berlin, where he was pursuing a special course of studies.

'97—Dr. E. D. Chipman has opened an office in Waterbury, Conn.

'98—Drs. C. L. P. Smith and W. J. Hogan are doing work at the Hudson Street Dispensary, New York City.

'98—Dr. F. P. Broderick has received an appointment to the hospital staff of the Massachusetts General Hospital.

'98—Dr. H. C. Rowland has recently received an appointment in the Presbyterian Hospital, New York.

'98—Dr. H. E. Hungerford has opened an office in Waterbury, Conn.

'98—Dr. Lewis B. Porter has recently passed the examinations of the State Medical Board of Connecticut.

'02—A. H. Sharpe has been a very promising candidate for Varsity football team.

BOOK REVIEWS.

The Liver of Dyspeptics.—By Dr. Émile Boix; translated by Dr. Paul Richard Brown, U. S. Army.

It is the object of this work to show that a certain form of hypertrophic cirrhosis of the liver arises from an auto-intoxication, by action of poisonous substances produced in gastric and intestinal digestion. The author does this in a very long and tedious way. The first part is devoted to a general consideration of auto-intoxication, the description of the poisonous products of digestion: lactic, butyric, valerianic, proprionic and other fatty acids, aldehydes, acetones, ptomaines, etc., as well as the circumstances favoring their origin. The second part dwells upon the liver of dyspeptics. The author illustrates by various cases that enlargement of the liver (hepatic congestion as he calls it) frequent in such patients. This affection, however, must be differentiated

from confirmed (?) cirrhosis, also illustrated by clinical cases, in which the organ shows a more marked hardness. Icterus as well as ascites and other conditions of stagnation are absent, probably "because the newly formed connective tissue does not interfere with the portal circulation." Lastly, in the third part, these clinical observations are supported by experiment. Animals received through a prolonged period with their food definite quantities of the above named substances. The clinical picture which they presented after such administration corresponds to that in men and the post-mortem examination showed marked portal sclerosis. The same holds good for coli-toxine. To state these facts it is unnecessary to write a book of 133 pages. It is quite evident and known by at least most pathologists and clinicians, that all sorts of noxious material, if injected in certain quantities for a prolonged period of time, will produce interstitial changes in the liver as elsewhere, particularly the kidney, to which the author has apparently paid much less attention. In so far as this book only confirms these ideas, it puts forward nothing very new. The author on the other hand does not convince one that these various bodies alone will ever produce changes which are great enough to form a cirrhosis of the liver which clinically and anatomically shows a definite type to rank it with genuine interstitial hepatitis or hypertrophic cirrhosis of the liver.

H. O.

The Psychology of Suggestion.—A Research into the Subconscious Nature of Man and Society, by Boris Sidis, M.A., Ph.D., Associate in Psychology at the Pathological Institute of the New York State Hospitals—with an Introduction by Prof. William James, of Harvard University. New York, D. Appleton & Co., 1898.

With entire candor we can assure Dr. Sidis that the wish expressed in his preface has been fulfilled—he has written a book, "not only interesting but stimulating to thought and useful in practical life;" but this does not preclude us from observing many things about the book which are hardly entitled to the approbation we willingly grant to the work as a whole.

In the first place, we must take exception to the arbitrary extension of the ordinary connotation of the word by which he collects under the one title, "suggestion," three notions which should be kept distinct and should be provided with a distinguishing nomenclature, viz: first, the imparting of an idea, second, the reception of the idea, third, the execution of the idea.

The definition of Dr. Grossmann, quoted on page 11, "*der Vorgang bei dem eine Vorstellung sich einem Gehirn aufzuzwingen versucht*," includes all that can properly be comprised under the term—suggestion. The afferent portion of the "suggestion arc" we recognize as coming within the legitimate meaning of the word; the efferent portion is not properly included under the term "suggestion," and should be imbued with a name of its own. Nothing is more mischievous in a philosophical discussion than a juggling with terms and a wresting of them from their accepted legitimate use. A spade is a spade and a suggestion is a suggestion, and is not properly a suggestion plus something else, or, as in this case, a suggestion plus a concrete action following the suggestion.

In many minor details connected with the art of book-writing the author could have made it far easier for the reader to follow clearly and readily his thought. He should have recognized, for instance, being an expert psychologist, that it would be much easier to follow, remember and compare the experiments cited, if he would give complete names (fictitious, if necessary) to his subjects, rather than initials only. What Mr. David Wyzanski did we can remember and

distinguish from what Mr. John Smith did, whereas it is much more difficult to bear in mind the different acts of Mr. W. and Mr. S.

Again, in developing the experimental evidence of normal and abnormal suggestibility, a diagram or a fuller description of the apparatus used, or better yet, a simple drawing, would make the *modus operandi* of the experiments much better understood and their conclusiveness much more easily appreciated. In like manner a brief description of the use of the "planchette," of the operations of the "anæsthetic hand," of the nature of "Bradley's colors," of the art or practice of "crystalgazing" though perhaps superfluous for the laboratory expert, would serve to familiarize the casual reader with the materials of experimentation and give him an insight into the working of the psychological laboratory, advantageous to author and audience alike.

Under the same caption of careless book-making we also note numerous misprints and "lapseus calami" which will puzzle the incautious reader, such as minus signs (—) for signs of equality (=) in the equations on page 54, the transposition of the words "direct" and "indirect" on page 50, "slit" for "split," page 88, "facts" for "acts," page 119, and many others.

Many little phrases, such as "the * * * processes * * * are completely lacking * * * any element," etc., page 122, and the use of the word "magnitude," where he means "extent," make one think that perhaps English is not the author's native language, yet the extraordinary use of metaphor leads one to suspect rather rhetorical carelessness than unfamiliarity with the vernacular. A single sentence of very much mixed metaphor from page 77 will serve to illustrate: "The very conditions of hypnosis proclaim this fact; for they are but keen psychical scalpels and have the power to effect a deep incision in the semifluid stream of consciousness." It is rather a careless looseness of speech which will allow one to use the words "hypnosis" and "abnormal suggestibility" as absolutely interchangeable terms, and what purports to be an exact "psychological definition" of hypnosis on page 70, shows careless use of language.

Though the author has taken great pains to bring experimental proof of his matter wherever he could, yet although we readily recognize the difficulty of exact experimentation in the field of psychology, yet it is hard to place much value on the direct suggestions by word of mouth detailed on page 35, and the author certainly weakens the fabric of his argument by weaving into it such weak material. Further examination of the experiments leads one to feel surprise that to the list of experimental variants mentioned on page 38, he did not add the three most distinct and most commonly obvious factors of suggestion, namely: large size, brilliant illumination, and motility. He may well consider the ways of the advertising sign painter, and be wise.

His italicised dictum, page 43, in regard to an adorned, beautiful object, shedding glory on its homely neighbors—when applied to squares of colored paper, borders on the ridiculous; it is, however, only a somewhat conspicuous sample of a tendency to take prodigiously long leaps in progress along the slippery paths of logical argumentation. It is in many cases a very far cry from a set of rather hazy and undemonstrative experiments to an inference somewhat startlingly positive and broad in its general inclusiveness.

In seeking a graphic representation of the effect of somatic catalepsy, Dr. Sidis was certainly very unfortunate in the choice of the sphygmograph as a means when direct tracings from the finger tips of an extended cataleptic arm are as readily available and far more fairly illustrative. In fact, the interpretation of the sphygmograms of Plate II are more than suspicious, and the illustration of the alleged effect of the odor of vanilla upon the pulse is positively

"fishy." Dr. Sidis, it may be safely affirmed, has not strengthened his experimental proof by dragging into the argument the vexed question of the proper interpretation of the records of the sphygmograph. Plates III and IV indeed show substantially only the effect of stimuli upon voluntary muscles, and not, as claimed, upon the automatic functions. The late Dr. Ernest Hart would have taken, we fear, a malicious delight in pillorying the experimenter alongside of the too credulous Professor Luys.

The last part of Chapter XI contains a subtle critique of the psycho-physiological theory of memory. Though it shows some of its deficiencies it does not suggest the complementary corrections which the author's hypothesis would seem to allow.

This important and interesting chapter seems to be one of the few in the book where the author has failed to follow out his inferences as far as he might legitimately carry them. Would not the true interpretation of memory from Dr. Sidis's standpoint be that the old theory is correct as far as it goes, but that it accounts for only one-half of the phenomena? May not the theory of "physiological registration" be applied to the recollective faculty which he claims is the appanage of the "subconscious self," and the same theory of "physiological registration" be applied likewise and in addition to the recollective faculty which is considered by common consent to be an attribute of the "conscious self," and would not the union, the mating of these two expressions of a common faculty, be the true explanation of the full-blown function—memory? This would seem to be a legitimate corollary to the reasoning of the author.

The strongest and most valuable part of the book is contained in the three consecutive chapters, XXI, XXII and XXIII, on the physiology and pathology of subconscientness, on the case of the Rev. Thomas Carson Hanna and on the forms of subconscient states and types of amnesia.

It will be of interest to readers of the JOURNAL to recognize in the study of the most instructive case of Mr. Hanna the work of Dr. Goodhart, a graduate of this school in 1894.

Part III, on the very important matter of "crowd psychology," treats most interestingly of the phenomena of social suggestibility, society and epidemics, stampedes, mediæval mental epidemics, demonophobia, financial crazes, and of American mental epidemics. Even those who may not have the time or the inclination to read the somewhat abstruse and difficult chapters of more strictly philosophical discussion in the earlier parts of the book, cannot fail to find much that is not only interesting but stimulating to thought and useful in practical life in the seven concluding chapters.

L. W. B., JR.

BOOK NOTICES.

An American Text-Book of the Diseases of Children. Including special chapters on essential surgical subjects; Orthopaedics; diseases of the eye, ear, nose and throat; diseases of the skin, and on the hygiene and general management of children. Edited by Louis Starr, M.D., Consulting Paediatricist to the Maternity Hospital, Philadelphia; late Clinical Professor of Diseases of Children in the Hospital of the University of Pennsylvania, etc., assisted by Thompson S. Westcott, M.D., Instructor on Diseases of Children, University of Pennsylvania, member of the American Paediatric Society, etc. Price, cloth \$7.00; sheep or half morocco \$8.00. For sale by subscription. Published by W. B. Saunders, Philadelphia, Pa.

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ARMY MEDICAL WORK IN PORTO RICO.

By S. H. WADHAMS, M.D.

Acting Assistant Surgeon, 19th U. S. Infantry, Ponce, P. R.

Although much has been written concerning Porto Rico during the past few months, possibly a few remarks by a member of the medical profession stationed with the troops here on the island may be of interest to the readers of the JOURNAL.

We have heard considerable in praise of the delightful climate and even temperature of this island and doubtless it seems irreconcilable with the presence of so much sickness as really does exist among the soldiers. Just what proportion of the men have contracted disease since their arrival on the island it is impossible to say, but from the writer's experience with a regiment of U. S. Infantry it would appear to be as high as seventy-five per cent. It must not be supposed that this number of men has been in the hospital, simply that they have been more or less temporarily incapacitated for duty.

After considering the circumstances under which the occupation of this island took place, the amount of sickness among our soldiers is comparatively small. In the first place many of them were volunteers or recruits, enlisting in regular regiments for the war only. They were accustomed to life in a temperate climate and were illy prepared for the change to a tropical sun and rain. They were landed here a short time before the rainy season began and immediately undertook a field campaign which necessitated long marches over inconceivably poor roads. The beginning of the wet weather found them still out in the field. Day after day the men were

drenched with the rain and camp grounds were ankle deep in mud. There was an abundance of the regular army ration, but it was not suitable food for men suffering, as most of them were, with a severe diarrhoea. Added to all this, the soldiers were at this time leading a life of inactivity, and the mental depression and home-sickness incident to such surroundings played an important part in increasing the number of sick.

The facilities for caring for the sick have been surprisingly complete. In the district of Ponce, where the writer is located, there is, in addition to the regimental hospitals with the different commands, a general hospital located in the City of Ponce. This was formerly the old Spanish Military Hospital, and whatever may have been the Spaniard's short-comings in other directions, he certainly exercised excellent judgment in selecting a suitable hospital site. The building stands on a steep hill on the outskirts of the city, where, while every one down below is sweltering in the midday heat, there is always a cool breeze blowing in from the sea and the mercury registers several degrees lower than in the city. The hospital itself is a large, square, brick and stucco affair with a paved court in the center. The wards, which are very light and airy, open off from this central court. The water supply is abundant and of excellent quality. Here are treated the very sick men from all the troops in the surrounding district.

The working force at the general hospital consists of the interne staff of about fifteen men, a considerable number of trained nurses, besides a large number of hospital corps men. As in all up-to-date hospitals, there is a very efficient pathologist, Dr. Leary of Boston, who is Assistant Professor of Pathology at Tufts Medical College. The blood of every fever patient is examined for the plasmodium malariae and a Widal test made, thus ensuring an early diagnosis. One who has never treated typhoid fever in the tropics can hardly realize how satisfactory the blood examination is in a doubtful case.

About seventy-five per cent. of the troops have been troubled with a most persistent and exhausting diarrhoea since landing on the island. The cause of this disease is a matter of conjecture. In a certain number of cases one can attribute it to injudicious eating, but still there is a large number of cases for which no definite cause can be assigned. Change of drinking water, the heavy army ration, marching and drilling in the hot sun, all are probably to be considered in seeking for a cause. The diarrhoea is most difficult to control, particularly after it has been allowed to go on without treatment for some time.

These cases often become dysenteric and, then, only the most painstaking care with a long rest in bed brings the sufferer through. Patients with diarrhoea emaciate rapidly and recuperation, even after the diarrhoea has been checked, is in most cases very slow and in some only accomplished by a return to the States.

Of the acute infectious diseases in this climate, typhoid is to be feared more than any other, but, fortunately, there has been nothing like an epidemic. Most of the cases which have come under my notice have been characterized by a sudden, severe onset, or, after running a fairly mild course, convalescence with exceeding slowness. The first class of cases are marked by an abrupt seizure, high temperature, yielding very reluctantly to ice baths, symptoms of intense toxic absorption, weak heart action, and almost invariably terminating in death in a few days, sometimes within forty-eight hours. One case, which I call to mind, illustrates this type very well. A soldier, whose previous health had been excellent and who had been performing his usual duties up to date of seizure, walked into the hospital complaining of severe headache and of feeling "feverish." His temperature was found to be 106.4°. Recollect that this was his first appearance on sick report, and he absolutely denied feeling badly up to the morning of the day on which I first saw him. In spite of repeated ice baths his temperature ranged from 104.5 to 105.5, and once again reached 106°. There was none of the symptoms of typhoid present, and a conditional diagnosis was made only after a negative blood examination for the plasmodium. The patient failed rapidly and died on the fifth day. The autopsy showed the most extensive swelling and hyperplasia of the solitary glands and Peyer's patches in the lower two and a half to three feet of the ileum. The most noticeable point was the entire absence of ulceration, indicating that the patient died before the end of the first week of the disease. Unfortunately this type of the disease is not infrequent, several cases having come under my observation recently.

The other class of cases, characterized by a tardy convalescence, recurring slight rises of temperature or a distinct relapse after the patient is apparently on the road to recovery, are exceedingly annoying. The utmost care must be exercised in the treatment and feeding even after the temperature has been normal for ten days. Relapses are much more frequent than in the North, though unfortunately there are no figures available bearing on this point. The death rate from typhoid

will compare favorably with that in almost any hospital in our large cities, and when we consider the disadvantages under which the whole work is done, the long rides, frequently twenty-five miles, in heavy, jolting government ambulances over rough roads, it is surprisingly low. In a series of 836 cases treated in the General Hospital for the District of Ponce forty-three have died, making the death rate a trifle over five per cent., and it is confidently expected that the next report will show even a lower rate than the above.

It is very natural to suppose that there would be a great deal of malaria here, but fortunately that is not the case. After having treated a considerable number of soldiers from the Cuban campaign at Camp Wikoff, as was the writer's privilege, and having seen the frightful effects of pernicious malarial infection among them, the information that the disease was comparatively rare here was received with pleasure. Indeed, since my arrival not a single case has come under my care. Malaria of the tertian type is frequently met with, but yields very readily to quinine. Except along the coast there is almost no low or swampy ground, the interior being exceedingly mountainous. The topography of the country, allowing of thorough natural drainage, is probably the cause of so little malaria.

Yellow fever is practically unknown. To be sure, four cases, I believe, have been reported, but there seems to have been some doubt as to the correctness of the diagnosis. Physicians who have been in practice in the City of Ponce for years say they have never seen a case of yellow fever. With ordinary precautions against importation of the disease there is almost no danger of an epidemic.

A comparatively frequent disease among the natives, and one of which we see very little in the colder climate of the States, is elephantiasis. The common occurrence of this disease would point towards some infective origin, and I believe the best authorities on the subject attribute the cause to the *filaria sanguinis hominis*. This parasite circulates in the blood and lymphatic vessels of infected persons in great numbers. By plugging up the lymph vessels they give rise to lymphatic varix, lymph scrotum, chyluria, filarial orchitis, and without doubt to elephantiasis. In the production of elephantiasis the process of inflammation is added to the mere plugging of the lymphatic vessels. As the mosquito is the intermediate host of the *filariae*, the possibility of infection is worthy of consideration. The condition of life in the tropics is such that not only the

native, but the most fastidious American is constantly exposed to infection. Drinking water is probably the most common source of infection, and preventive measures should be along this line. It would not be at all surprising if, in the course of a year or so, cases of elephantiasis should develop among the soldiers.

The rainy season is over and the pleasant part of the Porto Rican year is just beginning. The daily number of sick, which was frequently as high as twenty-five per cent. while the men were in wet and muddy camps, has already dropped to eleven per cent., and it can be confidently predicted that another month will see a great improvement over this. The men are gradually learning, in many cases by most bitter experience, that they cannot eat all kinds of tropical fruits and expose themselves heedlessly to the hot midday sun. Except during the rainy season, the weather is delightful. The country is high and well drained, the water supply is excellent and with reasonable precautions one ought to enjoy as good health here as in any city in the United States. The troops are becoming acclimated rapidly and in a short time the number of sick will be no higher than at the regular army posts in the States.

PONCE, P. R., November 25, 1898.

A CASE OF LEUKAEMIA CUTIS.

BY HORST OERTEL, M.D., NEW HAVEN, CONN.

The following lines narrate the history of a case which deserves a more complete and detailed description than the one which I am able to give, though every attempt was made to obtain as complete data as possible.

The patient was a man of about 40 years, unmarried, who had been in fairly good health until about two years ago, when he was first taken ill with "various stomach complaints and malaria." The attending physician, who, since then, has treated him until his death, states that at that time he had an irregular intermittent fever and a somewhat enlarged spleen, which he regarded as amyloid (?) spleen consequent to malaria. This "malaria," which finally subsided, was characterized by a strong resistance to quinine, in fact, it never yielded readily to it, and arsenic was, therefore, added to it. But the patient recovered sufficiently to attend to his duties. His appetite was of the best, and indeed continued so until two days before his death, when violent vomiting set in. Several months, how many can not now be determined, before this happened, his trouble became aggravated; the spleen enlarged considerably, he emaciated, had irregular fevers and "a long, hard inflammatory tumor appeared over the right rectus abdominis." This was diagnosed as myositis and treated with ichthyol, under which treatment it disappeared. A few weeks later the attending physician noticed "that there appeared on the skin small nodules, irregularly distributed over the whole body." They seem to have been observed first on the chest and arms and then in other parts of the skin (see protocol of autopsy below). How rapidly they grew I am unable to state. This settled the diagnosis to multiple sarcoma of the skin. It was subsequently decided to send the patient to New York to a noted specialist for treatment with erysipelas serum. The authority there, however, sent him back with the reply that he did not consider the case to be one suitable for his treatment.

At that time I suggested to the attending physician, who related the case to me, that a blood examination might have

been more valuable than several injections of erysipelas serum. He considered it unnecessary to go to this expense and the subject was dropped. About a week later, however, he suddenly appeared with a slide of dried blood. The picture which it showed agreed well with the anamnesis and history and was conclusive for diagnosis. At once the enormous increase and character of the white blood corpuscles were evident. Even the unstained specimen showed, besides numerous polynuclear cells, very large mononuclear cells (Mastzellen, myelocytes) and granular (eosinophile) cells. A second sample for staining was requested, but never obtained.

Before going any further, the protocol of the post-mortem examination must be given, which I was requested to make a few weeks later. Unfortunately this report must be just as meagre as the preceding history. The autopsy had to be made, two days after death, in the parlor of the house, without any accommodations, and the bad local custom of injecting a foul smelling liquid into the abdomen had been promptly followed. I was allowed to open only the abdominal cavity, heart and lungs had therefore to be extirpated from below, and to remove no organs. Finally I obtained permission to take the spleen, a little piece of the liver, and two of the skin nodules from the thigh.

Protocol of autopsy of X. Time, 12½-2 p. m.

1. The body of a man, apparently 35-40 years old; about 1.60 m. tall; extremely emaciated, no panniculus adiposus; muscles weak and atrophied; the hand is easily able to enclose the bicipital region of the right upper extremity.

2. The color of the body is white everywhere, except in those places where pressure has been exerted and bluish-red spots appeared. The hair of the head and beard not well developed, of reddish brown color, eyebrows and eyelashes darker. The face shows extreme emaciation, cheek bones very prominent, lips pale and delicate. The skin is pale. Scattered irregularly over the body, as far up as the neck, frequent on arms and chest, but most numerous and definite on the thighs, are found small, round, pale, hard spots varying from one to two cm. in diameter, some elevated, all freely movable over the subcutaneous tissue. On incision they show a yellowish white cut surface.

3. Extremities freely movable, no rigor mortis.

4. Eyes and mouth open; iris pale blue; teeth in fairly good condition; ears not large, well formed.

5. Chest small, abdomen distended.

6. An incision is made from the middle of the sternum, in the median line, to the symphysis. Very little panniculus adiposus; muscle tissue soft and pale. On opening the abdominal cavity a large amount of embalming fluid escapes. Small and large intestines distended; serosa opaque, of pale color, with injected vessels in a few places.

7. The large omentum very thin; it and the other peritoneum have formed adhesions everywhere; they are tightly connected with all the intestines in various places, and show thick, string-like masses in different situations.

8. Quite evident at once is an enormous spleen, which fills the entire left side of the abdomen, extending 8-10 cm. below the umbilicus and to the middle line. By very strong adhesions it is bound to the liver and diaphragm, pushing the heart upwards. On being removed, it proves to be 30 cm. long, 17 cm. broad, 6 cm. thick; its weight is 3 kg. It is of dark bluish color and dense consistency. The capsule is very much thickened. On incision, it shows a dark red surface; irregularly scattered through it are yellowish spots, the size of a pinhead; at the periphery a few yellowish, wedge-shaped spots, the bases of which are about 1 cm. broad. Removed with the tissues around the spleen is an accessory spleen, of the shape, size and color of a plum.

9. Left kidney, with considerable fat capsule, larger than normal, firm; capsule adherent; surface smooth, white, with bluish red and yellow spots. Cortex broad, pale, dotted with spots of the same character. Pyramids reddened.

10. Right kidney; same condition.

11. Liver larger than normal, dense surface of pale yellow-brownish color; on section pale yellow, acini distinct.

12. Heart the size of the fist of the man; right side moderately covered with fat; walls normal in thickness, with dark-brownish places; valves normal.

13. Lungs, in upper portion of dark red color, lower portion of grayish color and emphysematous; the tissue has a crepitant touch, but soft. On section a large amount of a clear, frothy liquid escapes. On pressure the liquid may easily be squeezed out of the lung tissue.

Pathological Diagnosis:

Volumen auctum (hyperplasia) lienis cum infarctis hæmorrhagicis inveteratis.

Nephritis parenchymatosa hæmorrhagica chronica.

Hepar adiposum.

Peritonitis chronica adhaesiva.

Emphysema loborum inferiorum et œdema pulmonum.

Degeneratio fusca cordis.

Nodulæ circumscriptæ cutis.

We have, therefore, to do here with a case of leukaemia associated with that condition of the skin which is known under the general name of leukaemia cutis, and it is to this that I wish to call attention. According to Unna,* from whose work on the pathology of skin diseases I cite the following statements, leukaemic skin lesions were first observed by Bisia-decki† in a patient 50 years old. They consisted of faintly red, centrally slightly depressed, pea-sized, somewhat elevated, soft nodules, movable with the skin. They were more numerous on the face and back than on the neck, chest, and extremities. Similar were the conditions in the case of Hochsinger and Schiff‡ in a leukaemic boy, 8 months old. Here were nodular, cellular infiltrations between cutis and hypoderm, by which the superficial fat lobules were changed to lymphatic tissue and the glands closely surrounded by it. This infiltration originated from the capillaries of the glands and superficial fat tissue, and consisted entirely of lymphoid cells without any admixture of spindle and giant cells. The papillary portion and the upper part of the cutis were almost free from infiltration, except where, by constrictions from above, the cutis would meet the infiltration.

The leukaemic skin affections described by Neuberger§ differ from those described above. Here we have a few, solitary brown, highly elevated, dense, lobulated, slowly growing and persistent nodules. They are formed by a dense infiltration into the cutis, consisting of small lymphoid cells, especially aggregated around the follicles. Neuberger put the origin of this lymphatic formation in the surroundings of the coiled tubes, which themselves remain intact. Unna|| doubts that in either of these conditions a lymphatic growth takes place, but regards the nodules as granulomata. He refers to his case of pseudoleukaemia, in which a tuberculous exanthema proved to be a typical granuloma.

*In Orth's Handbuch der spec. pathol. Anatomie & Lieferung, bei Hirschwald, Berlin.

†Leukämische Tumoren der Haut und d. Darms. Med. zhrb. d. Gesellschaft der Ärzte, Wien, 1876.

‡Auspitz, Archiv; Vierteljahrsschrift f. Dermat. und Syph. Leukaemia cutis. 1887, S, 779.

§Über einen Fall von lymphat. Leuk. mit leuk. Hauttumoren. Verhandl. der deutschen dermat. Gesellsch. 2 and 3 Kongr. 1892, S, 216.

|| C.

Finally a third diffuse form of leukaemic dermatosis has been described by Kaposi and A. Wolff. With the symptoms of a scaly, moist eczema, especially of the head and hands, there occur diffuse, soft swellings of the skin and subcutaneous tissue, associated with tumors, the size of a pea to a pigeon's egg, which ulcerate spontaneously, and leave large, flat, red ulcers. Microscopically, these tumors consisted of a non-vascular, fibrous stroma with dense leucocytic infiltrations, especially in the region of the coiled tubes; the hair follicles were not changed. Besnier and Vidal have thought of the possibility of a mycosis fungoides.

If we want to classify our case among the three forms of leukaemic dermatosis, the first has undoubtedly the closest resemblance to it. As stated in the protocol of the autopsy, this dermatosis consisted of small, round, pale, hard spots ranging from one to two cm. in diameter, some elevated, all freely movable over the subcutaneous tissue.

The microscopic examination of the two nodules taken from the thigh, revealed the following conditions: The epidermis and the upper part of the cutis showed no direct changes. The lower part of the cutis, however, was densely and diffusely infiltrated with small cells. This infiltration extended upwards, penetrating the fibres of the cutis and separating them, in advanced stages, into bundles. Some parts of the superficial fat layers were entirely taken up by this infiltration, others were left relatively undisturbed. Connective tissue sclerosis and blood vessels were absent. The cells had largely the appearance of leucocytes, characterized by their irregular, lobulated nuclei, rich in chromatin. Besides these, there were numerous fainter vesicular nuclei with distinct nucleoli, which had to be regarded as connective tissue nuclei and fibroblasts. Giant cells were absent. A definite structure of this infiltration could not be determined. The glands had entirely disappeared from the parts which were densely infiltrated; in the upper cutis they were intact and did not seem to have any relation to the process, indeed they and their surroundings were mostly free.

It therefore seems that these nodules cannot be regarded as pure and simple lymphoid formations; they resemble more, as Unna suggests, granulomatous tissue. At present I can say no more about it.

Perhaps one more point might be touched, "the hard, long inflammatory tumor," diagnosed as myositis. This was undoubtedly a string of thickened peritoneum, so characteristic of chronic peritonitis.

In closing, I cannot help expressing my regret that the diagnosis was made so late and under so many difficulties. The general character and progress of the disease should have suggested its true nature, and the blood examination would then have established the diagnosis at a much earlier date; but peculiar as it is, while every physician admits the necessity of percussion and auscultation, the microscope seems a luxurious toy to many, which deserves much less attention than perhaps the doubtful curative effect of erysipelas serum!

Qui bene diagnoscit, bene medebitur, not vice versa!

My thanks are due to Dr. Ferris for kind assistance in the preparation of the microscopical specimens.

THE VENOM OF POISONOUS SNAKES.

BY ROBERT WILSON, JR., M.D.

Instructor of Bacteriology and Histology at the Medical College of the State of South Carolina; Bacteriologist to the Board of Health, Charleston, S. C.

We are told by trustworthy authority that in India the annual mortality from the bites of venomous serpents reaches the enormous figure of 20,000. In our own country deaths from this cause are comparatively rare, but now and then they do occur in the southern states. The slight danger to which we are thus exposed, however, in no way lessens for us the scientific interest attached to the subject, nor detracts from the practical value of the painstaking labors of those who have devoted their time to the study of serpent venom.

The venom gland of snakes is a modified parotid gland, and in some of the poisonous varieties it attains to an enormous size. Designed originally for the innocent function of digestion, Nature, ever careful to preserve her species, has converted the secretion into a powerful weapon of defense by endowing it with its deadly properties.

The digestive power of venom was investigated in 1884 by Lacerda, who found that it emulsified fats, coagulated milk, dissolved fibrin and coagulated egg-albumen, but had no influence upon the conversion of starch into sugar. These results have been corroborated by the researches of Wehrman, published during the current year. The strong resemblance between bacterial poisons and the venom secreted by snakes is strikingly illustrated by the destructive action of the digestive ferments upon the latter. Injected separately these ferments possess no curative or preventive action, but when mixed previous to injection the influence of some of them upon the toxicity of venom is very great. Wehrman experimented with both animal and vegetable ferments, mixing them with venom in the proportion of 1 part of the latter to 4 parts of the former. The venom was of such toxic power that when injected alone the guinea-pigs were killed in $2\frac{1}{2}$ hours. When mixed with ptyalin the venom had no toxic effect whatever, even when injected immediately. The effect of pepsin was less

certain; one guinea-pig of two experimented upon died in four days, while the other lived. The effect of pancreatin, again, was very marked; of the four guinea-pigs employed all lived. In this instance the venom had been in contact with the ferment for twenty-four hours at 37°. Rennett appeared to have no effect beyond a very slight postponement of the fatal termination. Of the vegetable ferments, papaïn alone seemed to exert any marked influence, ranking in its activity with ptyalin and pancreatin. It thus appears that ptyalin has the strongest destructive action, and the well known fact that snake venom may be ingested with perfect impunity is probably owing to the guardianship of this ferment. Should any by chance escape unaltered, the pancreatic ferment may be relied upon to dispose of it. The identity of the diastasic with the toxic element was not determined by Wehrman. The chemical nature of the toxic principle has been the subject of much investigation by Gautier, Wolcott Gibbs, Weir Mitchell, Phisalix, Calmette and others, but their results have been so contradictory and uncertain that we shall only mention them in passing, and devote our space to a more lengthy discussion of the pathological effects of venom and the results of the enquiry into immunity and serum therapy.

Allusion has been made to the resemblance between snake venoms and bacterial poisons exhibited by their behavior in the presence of ferments. Hankin asserts that the poisons of tetanus and diphtheria bacilli "are closely allied to, if not indistinguishable chemically from, the poisons of venomous snakes." Whether this be true or not, a study of pathological changes will reveal a very great similarity in their activities. The toxic force of venom varies with species; with age; with the season of the year; and is greatly increased by prolonged abstinence from food. The effect produced by inoculation depends not only upon the toxicity of the particular venom injected and the amount used, but also upon the mode of introduction. When taken into the stomach the effect is nil. Subcutaneous inoculation is less rapidly fatal than when the poison is introduced into the veins directly. When thus injected one ten-thousandth part of a gramme is sufficient to produce the instant death of a rabbit, so terribly potent is the poison; and so enduring is its deadly activity that it may still be fatal even after twenty years' preservation in alcohol. Like many bacterial poisons, subcutaneous inoculation produces both local and general effects. The most marked local effect is caused by the crotalus venom, in which case "the underly-

ing muscles are reduced to an almost pulpy blood-stained substance."

The internal organs which are most extensively involved are the liver, the kidneys and the lungs. The liver is friable, deeply congested, and yellowish in appearance. The kidneys are congested, soft and hemorrhagic. The lungs also are greatly congested; some portions, especially if the animal has lingered for some time before dying, are airless and slightly elevated from the general surface. The spleen and heart present no visible lesion. The intestines are generally very hyperæmic. But it is the microscope which reveals to us the real extent and character of the venomous influence.

The most prominent alteration presented by the liver is the extensive fatty degeneration which occasions the yellowish hue noted macroscopically. This change takes place very rapidly in dogs, which animals appear to be especially susceptible to venom poisoning. When death occurs very quickly the liver cells are cloudy and granular. After several hours the protoplasm becomes condensed in parts, leaving ill-defined spaces or vacuoles. As this necrotic change grows more intense, the nuclei begin to feel the deadly influence and stain more feebly, owing to deficiency of chromatin, part of which has undergone solution. The nuclear fluid, which normally does not stain by basic dyes, now does so on account of the dissolved chromatin. The nucleolar chromatin next loses its peculiar coloring property. Finally, all the structures disappear and nothing is left but a granular mass bound by the membrane of the cell, a bare "skeleton" of the cellular body, as Nowak expresses it. When a very strong dose is given a dog, an extreme destruction of hepatic parenchyma may occur, resulting in a confused mass of cells and debris, perhaps floating in extravasated blood or an albuminous fluid. When the process is of less intensity, it is not uncommon to find normal cells side by side with those undergoing degeneration. If the animal lives long enough the epithelial lining of the biliary passages becomes affected by fatty degeneration. Sometimes a round-cell infiltration occurs, appearing in the tissue around the tubes, between the epithelial cells, and even in the lining of the tubes. The hepatic trabeculæ are generally greatly distorted by the pressure of the enormously dilated blood capillaries.

The kidneys are affected in a similar manner to the liver, but much less intensely. After several hours little drops of fat may be seen in the cells of the convoluted tubules, lying

about the basal portions of the cells which themselves are unchanged. Sometimes the endothelium of Bowman's capsule is the seat of a slight fatty change. The endothelium of the blood vessels is said never to be affected. After a longer time, granulation necrosis and consequent vacuolation of the cells of the convoluted tubules may take place. Sometimes cylinders composed of detached cells or of the débris of cellular disintegration are formed in the tubules. The cells of Henle's tubules are affected less markedly. The straight and collecting tubules may contain masses of cells which may be atrophied, but are rarely necrosed. All the tubules contain red blood corpuscles. The renal blood vessels are always greatly distended; and not infrequently interstitial hemorrhages occur from their rupture. These hemorrhages seem prone to take place about the capsule of Bowman. Within the capsule are often found formless masses consisting of detached endothelium and blood corpuscles, sometimes almost filling the capsule and greatly compressing the glomerulus. The spleen presents no special alteration. In severe cases slight fatty degeneration occurs. The heart also is occasionally the seat of a slight fatty change.

The lungs are the seat of parenchymatous inflammation, similar to that which occurs in the liver and kidneys but differing in degree. The capillaries are dilated and engorged with blood, and the vesicles filled with an exudate of red and white blood cells and epithelium. The white cells may be in such enormous quantities as to resemble a purulent infiltration.

These pathological details serve to emphasize the striking similarity between the actions of poisons having such widely diverse origins as serpents and bacteria. Nowak in a recent publication, from which I have garnered largely, has noted, as Sanarelli had previously done, the wonderfully close resemblance between the pathology of yellow fever and that of venom poisoning. In snake-bite poisoning, however, there is an absence of marked effection of the alimentary canal, while in yellow fever the pulmonary disturbances are wanting. The morbid changes of septicaemia are likewise so similar to the conditions we are discussing as to occasion the suggestion that death is really due to a bacterial infection and not to venom intoxication. The rapidity, however, with which in many cases a fatal termination follows the bite, seems to negative this theory.

This analogy of venom to bacterial toxins demonstrated by physiological and pathological research was "assumed" by

leucocytic exudate with venom produces a retardation of intoxication and often definite recovery.

Calmette has likewise tested the soundness of the theory that antivenene acts by stimulating the activity of the nervous system. By depressing the nervous functions by such agents as curare, ethylic alcohol, chloral, bromide of potassium, the state of immunity previously induced was wholly unaffected, although the dose of venom injected was sufficient to produce death in the controls in 15 minutes.

RADICAL TREATMENT.

BY EDW. W. GOODENOUGH, M.D., WATERBURY, CONN.

Some thoughts expressed in a very able paper read by Dr. W. L. Barber at a recent meeting of the Waterbury Medical Society, together with a law passed by the Connecticut Medical Society at its last meeting, compel me to correct some erroneous views about the so-called "Contract System." I say "compel," because "I am making the practice of medicine a business and not a profession,"* and am doing "something derogatory to my character and standing as a professional man."† God forbid.

In Waterbury there are at present sixty physicians; of that number twenty-eight are members of our state society. Fourteen of these, or just fifty per cent., now hold lodge contracts, and seven others, or twenty-five per cent. more, have at some time in their professional career held indefinite contracts. By "indefinite" I mean contracts taken for a definite sum of money when the absolute amount of work done could not be foreseen. Three-quarters of our Waterbury members have thus been guilty of unprofessional conduct and only one-third of that number have so far repented of their sins as to lay aside the emoluments of their office. In Naugatuck every member of the state society has contracts, and the system is satisfactory to all. What is true of these towns is true of others to a greater or less degree. Has this habit, like that of cocaine, spread among us unawares, until we must cut off all to save ourselves?

There are two points to be considered.

First—Is it not undesirable for us to pass prohibitory laws, even if such contracts are not altogether desirable? Instead of "Physician, heal thyself," is not the saying, "Cast first the beam out of thine own eye, and then thou shalt see more clearly to cast the mote out of thy brother's eye," more applicable?

Second—Is not the fact that our members take such contracts a benefit to the society as a whole? I think it is.

In July, 1893, a young friend came to me suffering from a Colle's fracture of the forearm. I reduced it for him and cared for the case until the fracture had united. Although I did not intend to settle in that town, to avoid undercharging I went to

* Conn. Medical Society Proceedings, 1898, p. 34, Remarks.

† Conn. Medical Society Proceedings, 1898, p. 33, Litchfield county resolutions.

the surgeon who otherwise would have been called and inquired what his fee was for attending such a fracture, telling him who the patient was and why I wanted to know. He informed me that he received from fifteen to twenty-five dollars, according to the character of the fracture and the amount of after attendance. I charged the boy's father thirteen dollars, which he paid. During the following winter the wife of a well-to-do farmer in the same town was thrown from a wagon and fractured both arms. She was taken home and was attended there by the physician aforesaid. His charge for care of both fractures was eight dollars. This included attendance at a house three and a half miles from his office, all attendance needful until full recovery took place. Thus he gave me a name for overcharging which has never wholly been blotted out. This gentleman is a fellow of the Connecticut Medical Society and a prominent member of that county society which says such stringent things of physicians who take contracts.

A short time ago I was called to attend a boy eight years of age, who had a fracture of the middle of the femur, compression of the brain from hemorrhage, and a face and head badly cut and bruised. His thigh was fixed in temporary extension before I left him, an ice bag on his head and a cathartic administered. The next day, after working several hours to get a nurse, I engaged the best one obtainable. A professional brother of ability as a surgeon was called in consultation. In four hours I was requested by the parents to resign, and the consultant took my place. I had insisted that this regular brother should be called in, rather than an irregular practitioner whom the family preferred.

Several cases of mine in the last four years have gone to the hospital, either with or without my advice. Many are my patients no longer. These are examples of advantages taken by some older practitioners, fairly and unfairly, to the detriment of the younger men.

Paternalism in government is still a mooted question. Every intelligent citizen, who has the interest of popular government at heart, knows that laws on our statute-book unenforced are a great menace to such popular government. The injury of drunkenness to other members of the community beside the one intoxicated, none will question; but most of our professional brethren do each year question the right of the majority in each town to say the minority shall not purchase alcoholic stimulants in that town. A law against pool-selling was passed under pressure some years since; and yet pools

are sold at every race track without leave or license. Sunday liquor selling is contrary to law, but most of that which is done the police do not pretend to interfere with. We have a stringent law in our society against advertising. I attended over one hundred surgical cases during the first six months of this present year. Of this number, so far as I can remember, no more than two appeared in the newspapers with my name attached, and all reporters have a distinct request to omit my name in such a connection. When, however, we see details of several such cases, minor in importance, attended by a certain surgeon and find this gentleman's name published in such a connection a number of times in the same month, the law already made seems to lack enforcement.

A majority rules, but in this country no one should take away my rights without showing good and sufficient reason for doing so, not even if I stood alone in this matter. A large minority, if not a majority of the members of our state society have had a certain amount of practice arbitrarily taken away from them. Whom does it benefit if all who hold such contracts drop them? In a very small percentage of cases the present doctor will be retained by the lodges and paid by those lodges regular fees, less a discount. This method is being tried in Thomaston and is praised by the President of our state society. In a certain other small proportion of cases, the doctors who have sought for and passed this law will receive additional practice. Subtract from this their loss of consultation fees in those serious cases which have fallen by this law into the hands of irregular practitioners, and the real gain to these men will be little or nothing. Not less than seventy-five per cent. of the lodge fees and influence will be taken from members of the society who endeavor to abide by its laws, and pass into the hands of irregular practitioners, who, for our own protection and that of our friends, might better never have taken up medical practice.

As a society we get the name, deservedly, of being opposed to secret societies of all kinds, formed for mutual benefit. With such a name, we gain the contempt of men as well educated as we are, who, enthusiastically, and with reason, uphold institutions whereby the wage-earner of sound constitution is not to run behind when ill, because, as in duty bound, the strong look after the weak.

Now I wish to show that the contract system, so far as I am acquainted with it, is professional; and that it is directly beneficial to even those members of the State Medical Society who do not need or wish its assistance.

All contracts, in a business way, are taken for a definite amount of work. This is necessarily the case where the price for which such work can be done is modified by the amount of material to be purchased and the number of hours' work to be hired by the contractor. A doctor, then, is more of a business man and less a professional man if he makes a contract in which the amount of work to be done is definitely specified.

The clergyman has his salary, true type of the professional man; the expense to his parish graduated, as far as possible, so that those pay most who are best able. No one who has been a member of a clergyman's family will say that this salary is for a definite amount of work to be done. The lawyer of prominence has his retaining fees, the judge his salary, the younger man, when possible, his salary for smaller political offices in town, city and state work. Are they any less professional for being so paid? Is not the ideal professional man one who, although a laborer worthy of his hire, is not dependent altogether upon his bills sent out every three months for services rendered?

Many of the older physicians charged, and do still charge, according to the means of their patients. Our old family physician used to charge from nothing to five dollars for ordinary calls in the village where he lived, the capitalist paying the latter fee. Is there not here a hint for the older men to increase their income without blaming others for the fewer number of their calls?

Let us find, if we can, the main reasons why objections so bitter are made to lodge contracts. The main objections should come from British soil, where such contracts have been in existence for many years.

Dr. Chillingworth, described by A. Conan Doyle, is the best caricature I have found illustrating the point. Every student of medical ethics should read "The Stark-Munro Letters." Perhaps you all have read the monograph by Dr. Donaldson, of Fairfield, which was presented at the last meeting of our state society. Those of you who have not already done so should see the article in the *Medical Record* for July 16, 1898, by Dr. Hillis, entitled "The Lodge Doctor, His Advent, His Methods and His Influence on the Practice of Medicine." If this article were entitled "The Lodge Worker," or "Wire Puller," or we should substitute for this "The Political Wire-Puller," or "Church Wire-Puller," or a name like "The Leech," or "The Parasite," to indicate more clearly the individual there described, the statements with their extremes of exaggeration would come nearer the truth.

In a fixed percentage of men entering the medical field who think that *there* they can get the most money for the least exertion, and who have no love for their profession as such, some of the characters represented in these articles will exist, and the larger the city the more such practioners there will be. We cannot force them from the community; like the poor and the abortionist they are always with us. Most of these men are irregular practitioners because it takes more time, money and patience to become regular practitioners.

The most dangerous class is one composed of men better educated and with more ability, who have no consideration for the knowledge which twenty or thirty years' practice has given older men, who know it all and are absolutely unscrupulous. The best examples of this class in my own neighborhood are three men, no one of whom is a lodge doctor, although two belong to lodges which have no attending physician, and only one is an irregular practitioner. These men are none of them affected by the law under consideration.

It is a pleasure to know some of the men favoring this law. In a society with such men I consider it an honor to be represented, and it is with sorrow that, on this question, I must seem to be on the opposing side. But I can mention the names of men as honorable, as strict in their treatment of their professional brethren, who have lodges and contracts, and who are affected, as I am, by this unjust discrimination. They are now the younger men; twenty years from now they will be the hospital doctors, the men looked up to as elders, as well as honorable men in the profession. For the profession at large, a law that no member of the state society shall serve any hospital or dispensary except he receive a full money compensation, commensurate with the services rendered, would be no more harmful or foolish for our honorable leaders in medicine, than *this* law is to those who will be leaders twenty years hence.

Aside from the leeches, then, many of whom are not lodge doctors and who dishonor all professions and trades as well, we are told specifically that lodge doctors are largely underpaid and take lodge contracts because in that way they gain the families. It is true that we seek in any honorable way to do such good work with any patients we have, that they may recommend us to others, especially to those near and dear to them, their families. But when this is done in an honorable way how far does it affect the brother who has advanced beyond the contract line?

Out of some seventy-five families represented in my lodge in two and a half years, twelve have called me into their families. Of these one was for a single call only, the family physician being unobtainable, and nine others belonged at that time to irregular practitioners of the cut-rate type.

The other two were turned over to me because of continual intemperance on the part of their much loved attending physician, a member of our state society. Who has been wronged here? If anyone, the irregular practitioner who ought to suffer most. During the same time I have received in cash for lodge work, of all of which an accurate account has been kept, sixty-one per cent. of our regular fees, which are, one dollar per office call, one dollar per physical examination and two dollars per house call. I intend to make three calls where I would only make two were I obliged to charge full fees. Many of the office calls were for conditions of the most trivial character, and would not have been made were the patient obliged to pay each time the visit was made. Therefore, I received ninety per cent. as much as any good physician would have charged for doing the work. This, in spite of the fact that last year was so severe a one on the lodge, owing to unusual sickness, that at the end of the year there was only thirty dollars in the treasury. For the year 1897 and first half of 1898, I received over one hundred per cent. for all calls made. From my own experience and that of others in Waterbury, I expect to receive in cash not less than ninety per cent. for all work done. All cases of venereal diseases are paid for by the members as if they did not belong to the lodge.

A business contract is supposed to go to the lowest responsible bidder. When my lodge of Foresters was formed I was a charter member. I was asked what I would charge per member for its care each year. The highest price paid anyone in this vicinity was two dollars per member and one dollar for each examination. I considered my services worth as much as those of anyone else, and therefore that was my price; I only agreeing to give them the best service of which I was capable. They understand that they can get cheaper service, but are satisfied as it is. The treasurer, when last year the funds were getting low, asked a brother physician, who has a lodge for a dollar and a half a member, if he would like another one at the same price; he said "Yes," and then asked what the name of the lodge was. Being told, he said "No, that is a two dollar lodge and my price for it will be two dollars." This is pretty good for a "mercenary, characterless, unprofessional lodge doctor."

All the lodges in Waterbury cared for by state society members, this comprising nine-tenths of all lodges having medical attendance, pay at present a regular fee, varying from one dollar and a half to two dollars per member, according to the work or habit of the given lodge. Each lodge then takes the physician whom it chooses, not because he is the lowest bidder, but because he is the one wanted by a majority of the lodge at the price. One of our prominent physicians is now paid twenty-five cents more per member per year than his lodge paid the previous cut-rate practitioner. Those who need the lesson most are taught that the cheapest and the best are not always identical.

With more than half the physicians in our city outside the state fold, and new men coming in every month, think you these lodges will go a-begging? Are we seeking to get the young doctors, the best of them, into our medical societies? Are we seeking to get them in or to drive them out?

With our incomes necessarily straitened by purer hygiene and a more diffused knowledge of dietetics, the time is coming when we will need some better system of fees than that at present in vogue. What better way could we have than that our families should pay us yearly salaries, confinement cases and special operative work only excepted? The carrying of an increasing number of deadheads on our books from year to year, who never can keep up with their yearly bills, to say nothing of paying old ones, and who gradually become paupers and dead beats,—first discouraged, then careless, then worse,—is a problem with which we must struggle. Let us not begin by cutting off the assured income of any of our brethren, unless more clearly shown unfair than in the present case.

Do those of you who have investments bringing in interest, who have corporation contracts and railroad contracts good for a reasonable sum, who are medical directors of insurance companies, or health officers at a yearly salary, find such assurance a drawback to the best professional effort in other lines? Is hospital work so great a charity, when thousands would be glad to do it at the same price?

No one honors the experience of the older men more than I. No one rejoices more at the deserved honors which they receive. The ideal physician's practice is one in which the strong bear the infirmities of the weak. How better than that the strong members of the lodges pay for those of their number who, starting in with like prospects, fall by the wayside for a season. Here are presented a few facts on the right side

of a very troublesome problem. Underbidding is unprofessional and, as a practice, not to be defended. As is here shown, underbidding is unnecessary in lodge contracts, nor is it necessary to do the work for less than a reasonable price. This price can best be regulated, as fees are regulated, by the local societies.

In closing, I would repeat what has already been shown in another form. A very large proportion of my families and of those attended by other young men in regular practice come from the practitioners whom we cannot and do not uphold, from the cut-rate members of our own school, from the eclectics and the homeopathists. In upholding the professional ability of the older men whom we respect and honor, we help them to retain their old families more than they will believe. Some of our strongest work against unprofessional workers can be and is done through our lodges. Why, then, should we be compelled to drop them?

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SURGEON-GENERAL STERNBERG is quoted as saying, that in our military camps we should adopt either the water supply and sewage systems of civilized communities, or the custom of the Indians, who abandon a camp when it is fouled. Apparently the state authorities have considered that the plan of the aborigines could be safely followed at Niantic during the short summer encampment and that the ground would become purified by natural agencies before the next encampment. The facts as disclosed by recent investigations, however, seem to show that this is not the case and that the ground does not become completely purified during the period of disuse. There is reason to believe, then, that the present systems of water supply and sewage disposal are not safe even for the short encampment, and they surely are not such as would justify an occupation of the camp ground for a long period, such as has happened during the past summer. The portion of the camp ground occupied by the tents of the soldiers is a very densely populated tract, and it is surely against good sanitary usage to draw the water supply from wells beneath a dense population. It is clearly the duty of the state to provide the camp with water piped to the grounds from some outside and safe source, and also to provide suitable systems of sewage and garbage disposal

which will convey off the grounds the wastes of the camp. These alterations would call for replacing the military sinks by some form of trough water closet. We do not wish to be understood as believing that all the sickness of last summer was due to the defects in the sanitary arrangements of the camp, and certainly not as believing that the remedying of these defects in the way indicated would entirely obviate sickness in camp life hereafter. A large part of the sickness is doubtless due to the indiscretions of the men and to their lack of knowledge of how to care for their health under the conditions of camp life. But even if this be so, it is clearly the duty of the state to make such provisions as will give the men a fair chance to care for themselves. The experiences of the last summer also show that the men should receive regular instruction from their medical officers in the matter of camp hygiene.

* * *

THE first address in the second annual course of lectures under the auspices of the Yale Medical Alumni Association was delivered by Prof. Lewellys F. Barker, M.B., of Johns Hopkins University. To keep in touch with the modern methods of scientific research and progress is considered by the general practitioner to be almost an impossibility, and the value of such a course as our Alumni Association offers was fully appreciated by those who had the pleasure of listening to Prof. Barker speak "On Some Newer Methods of Neurological Investigation." Of particular interest was the description of the scientifically exact reproductions in wax of the various portions of the nervous system. These wax models, as an aid in the study and demonstration of minute nervous anatomy, are as much superior to the section and staining method now commonly in vogue, as that method was to the old time manner of investigation by the naked eye. The shape, appearance and relations of the olivary body will no longer be a question for the imagination of the medical student; its every sulcus and gyrus will be as clearly demonstrated as the major convolutions of the cerebrum are to-day. By the wax model the exact position and relations of the various corpora and ganglia at the base of the brain are easily appreciated, and the advantage, anatomical and clinical, of this means of study of the nervous system can hardly be overestimated. The second lecture in the course will be delivered January 19, 1899, by Prof. Samuel Alexander, M.D., of the Cornell University Medical College, on "Disease of the Prostate Gland." Dr. Alexander graduated from Bellevue Hospital

Medical College in 1882. He is a member of the County Society of the Academy of Medicine in New York City and is Visiting Surgeon to Bellevue Hospital. Dr. Alexander has made a special study of genito-urinary diseases, and has carried on extensive original researches in that department of surgery and medicine.

* * *

THE JOURNAL notes with pleasure the movement recently set on foot in the city of New Haven for the systematic examination of the vision and hearing of all pupils in the public schools. A point seeming especially worthy of praise is that the movement starts under the auspices of the Board of Education, at the instigation of Superintendent Kendall, and is certainly indicative of an efficient and broad-minded administration. Before a meeting of the oculists of the city, called at his request, Mr. Kendall outlined his ideas and wishes, and requested that a code of instructions and a plan of examination be drawn up and submitted to the Board of Education, as a guide for the school teacher. The examinations are to be made entirely by the various teachers. They are, of necessity, to be in no way scientific; the object not being for the teacher to determine whether the pupil has a hypermetropic or an astigmatic eye, but merely whether his vision and hearing are normal or not. And with the aid of the directions given, the teacher can make a sufficiently accurate examination. If the child fails to pass the required tests, a note to that effect is to be sent to the parents, with the recommendation that the child be examined by a competent physician. To have such pupils return a certificate of examination, signed by a regular practitioner, has been found impracticable in those cities where it has been tried. Yet we hope that the teachers will so emphasize the advantage of consulting a registered physician, that the already existing evil of unscientific examinations by opticians will not be magnified by the furtherance of what should be an illegal practice, and thus the whole intent and purpose of the system be defeated. We will not enumerate the general advantages to be obtained from such an examination of all pupils, since they were set forth in our last issue, but the proposed plan has several additional points to recommend it. It is certainly inexpensive. It provides for those children whose parents are unable or too indifferent to take proper care of their children. The teachers, on their part, are instructed in the general laws of light and vision, so that they will the

more intelligently consider the physical demands of their pupils. And the scheme is above criticism concerning the mercenary motives of any oculist. New Haven is to be congratulated upon the advanced position which her Board of Education has taken, and the state, as a whole, through its Legislature, could do well to follow the example.

* * *

NEARLY every medical journal one picks up in these later days contains one or more accounts of the treatment, successful or otherwise, of puerperal fever with the antistreptococcus serum. As our knowledge of the organisms of disease and the reactions they produce in the human body becomes more and more complete, we very naturally lean to the side of serum therapy. If the conclusions so far reached are correct, and we sincerely hope they are, we see in this an easy and efficient means of increasing the natural immunity of the body to the ravages of disease. The possibilities seem boundless, but the realities are at present very limited. The results of laboratory experiments must stand the test of practical every-day use, and too often we find failures where nothing but success had been anticipated. Experience is after all the great "weeder," and we must look to the busy practitioner for this experience. It was with a full appreciation of this fact that the committee, appointed by the American Gynæcological Society to report on antistreptococcus serum, has made an appeal to physicians of New York city for exact data with regard to any cases of puerperal fever they may treat. As a further incentive, an arrangement has been made with the New York Board of Health whereby sterile culture tubes will be furnished on application. These are to be inoculated with a sample of the discharge and sent in for examination. The attending physician will be notified at the earliest possible moment of the results of the examination, and fresh antistreptococcus serum furnished. In this way the practical utility of the serum treatment will be far more quickly demonstrated than it could be otherwise. It is every physician's duty and privilege to add what he can to the sum total of medical knowledge, and it is to be hoped that each one, of the several hundreds in Greater New York, will do his part in the further study of a remedy aimed at the mitigation of that much dreaded disease of the lying-in period.

* * *

WE wish to announce the election of H. C. Pitts, 1900, as Assistant Business Manager, and G. L. Buist, Jr., B.A., 1900, and W. E. Balmer, B.A., 1900, as Associate Editors of the JOURNAL Board.

MEDICAL SOCIETY REPORTS.

NEW HAVEN MEDICAL SOCIETY.—On Wednesday evening, December 7, a regular meeting of the society was held in its rooms on Chapel street. Dr. M. C. White presented some photographs of *Filariæ Sanguinis Hominis*, and gave an interesting history of the case from which they were obtained. A boy was sent to him with the history of albumen in the urine. Microscopical examination showed several minute white specks and in one of these filariæ were found. A case of diffuse papillary adeno-cystoma of the peritoneal cavity, following the removal of an ovarian cyst, was reported by Dr. Hawkes. A diagnosis of the affection was made from an examination of the ascitic fluid.

The aid of skiagraphs in diagnosing fractures was favorably recommended by Dr. Tuttle, and skiagraphs were shown of a case of Pott's fracture complicated by an impaction of the lower end of the tibia. The subject for discussion was on the "Prevention and Treatment of Lacerations of the Cervix and Perineum." It was opened by Dr. Hawkes. He considered that the lack of a suitable suture was the chief obstacle in the repair of lacerations of the cervix. Torn perineums should be sutured at once, without either local or general anesthesia. Dr. Bacon saw no objection in suturing the cervix with silk worm gut, provided the cut ends of the suture were encased in gutta-percha. Dr. Phelps spoke of a simple method now in use at the Sloane Maternity Hospital, New York, for laceration of the cervix, with rupture of the circular artery. It consisted in bringing the patient's knees together, and in exerting pressure on the fundus in order to prevent the uterus from filling. The hemorrhage was in this way easily controlled.

The subject for discussion at the next meeting of the society will be "The Diagnosis and Treatment of Organic Disease of the Heart."

MEDICAL PROGRESS.

EHRLICH'S DIAZO REACTION IN URINE.—(*Weiner Klenischen Woch.*) Kroekiewicz, after an examination of 1,105 different cases in which he made 16,167 tests for Ehrlich's diazo reaction, draws the following conclusions: In diseases of the kidneys,

not due to toxic medicaments containing coloring matters it is never found. In carcinoma of the stomach, liver, oesophagus, rectum, pancreas and uterus the reaction is negative; but in primary carcinoma of the ovaries it is positive. When found in pulmonary tuberculosis the disease runs a short and fatal course. This rule holds good also in the incipient stages. Albuminuria and intestinal ulcers in phthisis have no effect on the reaction. The test is negative in phthisis when complicated with nephritis. In tuberculosis of the glands or mucous membranes the reaction is occasionally found. It is constant in miliary tuberculosis. In typhoid fever it is found even in the mildest attacks in the first and second periods of the disease. As long as the reaction is present in the urine, typhoid patients cannot be considered convalescent. If in convalescence of typhoid the reaction sets in, it is generally a sure sign of a relapse. The author recommends the test on account of the prognostic value in typhoid and tuberculosis.

PROTECTIVE ACTION OF THE LIVER AGAINST MICROBES.—(*Sim. Med.*, Oct. 19, 1898.) As a result of a series of experiments, Roger found that certain cultures of anthrax bacillus introduced into a branch of the portal vein did not kill rabbits, whereas cultures of the same virulence injected into other blood-vessels did cause death. The lungs possessed a protective action against the streptococcus, whilst the liver possessed none. The staphylococcus aureus was easily destroyed, while the bacillus coli communis seemed actually to thrive in the liver tissue. Both liver and kidney arrest the growth of oïdium albicans. Further experiments to determine the conditions modifying this protective action showed that it was less marked if the animal was kept without food, though it still remained observable after three days of fasting. A $\frac{3}{4}$ c. cm. injection of bacillus prodigiosus into an intestinal vein robbed the liver of its protective power against staphylococcus aureus. Large doses of glucose given by the mouth weakened the resisting power of the liver, while small doses strengthened it. The effect of ether was most striking; 5 drops injected into the portal vein or 2 c. cm. given by the mouth abolished the liver protection, while small doses increased it. Injected subcutaneously the effect of ether was much less marked. The beneficial action of potions containing ether in certain infectious diseases may be explained on the supposition that dilute doses of ether given in this way increase the protective action of the hepatic cells against certain microbes.

TREATMENT OF ANEURYSM BY THE USE OF GALVANISM.—Dr. D. D. Stewart (*Phil. Med. Journal*, Nov. 12, 1898) believes this method to be a decided advance over the older plan of treatment of aneurysm by the mere introduction of filiform material. As practiced by him it consists in introducing into the sacs, under the strictest antiseptic precautions, a fine coiled wire, previously so drawn that it may be readily passed through a thoroughly insulated needle of somewhat larger caliber than the wire, and, after introduction, assume snarled spiral coils. With a moderate amount of wire the entire caliber of the sac will thus be occupied, unless the cavity be already filled with coagula or the sac be of unusual size. Silver, gold or platinum wire are the preferable materials. The amount of wire required depends, necessarily, upon the caliber of the aneurysmal sac, and must be decided upon with the greatest nicety of judgment. The anode or positive pole should invariably be the active electrode. This is connected with the wire and the negative rheophore, a large clay plate, or an absorbent cotton pad of equal dimensions, placed on the abdomen or back. The current is slowly brought into circuit and its strength noted by an accurate milliampèremeter. The increase is gradual for a few moments until the maximum strength supposed to be required is reached. It is maintained at this until the approach of the end of the session, and then gradually diminished to zero, after which the wire is separated from the battery, the needle carefully withdrawn by rotation and counter pressure, and the released external portion of the wire gently pulled upon and cut close to the skin, the cut end being then pushed beneath the surface. The current's strength must be rather high—from 40 to 80 ma., and the session lasts from three-quarters of an hour to one and a half hours. Thus used, the following effects may be expected: The mere introduction of coiled, snarled wire, engaging all parts of the sac, acts as an impediment to the blood-stream and at the same time offers to the eddies set up multiple surfaces for clot-formation. By the application of a strong galvanic current through coils of wire, so disposed that all areas of the sac are reached, it follows without exception, that consolidation by virtue of clot-formation is promptly and invariably produced. The solidification is rapid and generally manifest before the end of the electrical session, through changes apparent to the eye and the hand, in the pulsations and in the degree of consistence of the sac wall. These changes become more decided in the course of a few days, until, after a time in the most favorable case a hard

nodula, with a communicated pulsation only, replaces the previous expansible tumor. The electrolytic effect of the coils of wire in contact with the sac wall is believed to favor the formation of wall-thrombi, and from these organization extends to the red-thrombi formed directly about the centrally disposed wire, and solidification and organization result. This method of treatment has been used by Kerr, Rosenstern, Hershy Barwell, and the writer, with the most favorable results in cases of aneurysm which were totally beyond slightest hope of cure at the time of treatment. The writer believes this method of treatment in selected cases of aneurysm, if intelligently carried out on the lines laid down, to be of distinctive value over all other operative procedures now in vogue.

THE INFLUENCE OF LYMPHOID HYPERTROPHY IN EPILEPSY.—
Dr. Urban G. Hitchcock (*N. Y. Medical Journal*, Nov. 5, 1898.) It has long been a matter of definite and wide observation that the area closely adjoining the seat of lymphoid hypertrophy in the pharyngeal vault is very susceptible to irritation, and has been known, under certain conditions, to excite by its reflex activity even so grave a nervous manifestation as an epileptic attack in patients possessing the necessary morbid predisposition. Embarrassed nasal respiration, due to turbinated hypertrophy or to polyps, has apparently received more attention in this especial regard than lymphoid growth. In one case, however, which came under the writer's observation, this latter condition bore such a decided relation to the convulsions as to furnish a striking illustration of the foregoing statements. The patient was a boy of eleven, of good mental activity and negative family history. Had been a mouth breather since a few months of age. Epilepsy in the more violent of its forms commenced after recovery from an attack of pneumonia when two years old, the seizures occurring at intervals of about two to seven weeks. At seven petit-mal became super-added, following, it was said, the removal of his tonsils. The attacks reached ten a day. No benefit having followed the use of bromides, the patient was referred for nasal examination. Marked lymphoid hypertrophy was found and the growth removed under ether. As a result attacks of all kinds ceased for eighteen months. During that time, however, he passed through an operation for appendicitis and a serious attack of pneumonia. In October, 1895, the attacks having begun to recur during the previous August, another operation was done under ether for the removal of the remnants of lymphoid tissue. Again the attacks ceased,

until five months later a blow on the head was followed by the re-establishment of the petit-mal. This has continued in spite of various forms of treatment. While it is manifest that an affliction so widely prevalent as lymphoid hypertrophy cannot commonly be an important factor in the production of a disease of such relative infrequency, still, given the existence of epilepsy and allowing for the influence of such well established causes as heredity, drug habits, etc., the advantage of including it among the possible exciting causes is once more exemplified.

DISINFECTION OF THE HANDS.—(*Boston Med. and Surg. Journal.*) Dr. R. F. Weir in an article under the above heading concludes that corrosive sublimate solutions are unreliable. He claims the most perfect disinfection by the following, in the order named; nascent chlorine, alcohol, potassium permanganate. Of these the chlorine treatment is least hurtful to the hands, alcohol the most trying. He gives the following method of procedure in disinfection with nascent chlorine. After the usual scrubbing with soap and water and the use of green soap and cleansing of the peri-ungual spaces, one or more large crystals of carbonate of sodium (washing soda) are taken in the hand and covered with about a teaspoonful of bleaching powder (chlorinated lime), and enough water added to make a thin paste, which at first feels warm, and from which fresh chlorine gas comes. This is rubbed for a few minutes over hands, nails and forearms until a creamy paste is formed, or until the sodic crystals impart a cool sensation, or until rough grains of bleaching powder have mostly disappeared when the hands are washed in sterile water.

AXIS TRACTION WITH ORDINARY FORCEPS.—(*British Medical Journal*, Nov. 5, 1898.) T. Archibald Dukes, M.B., states that the recent discussion at Edinburg on the use of midwifery forceps showed that the easiest method of applying axis traction with ordinary forceps was not generally known. His explanation of a simple and highly practical way follows. The patient being in the ordinary left lateral position, insert the blades so that the locks face together, let the handles assume their natural position, close to the symphysis pubis, pointing upwards. Allow them to remain during the whole process of extraction in this, the position which they naturally assume, pointing more and more forward as the head descends. To extract, grasp the forceps at or above the lock with the left hand and place the hollow of the right hand on the posterior surface of the extremities of the handles, so as to be able to

push with the right hand and pull with the left, by an action somewhat similar to that used in making a stroke with a paddle. Then, keeping both arms the whole time rigid and extended, place your own chest, facing the patient, in the desired line of traction—which, with head at brim, is a straight line passing from the patient's umbilicus through her coccyx—and pull with your back from the coccyx. The whole force is thus expended in urging the child's head towards the coccyx, not expended on stretching the vulva, in pulling the forceps out of their natural position, or in pressure on the pubes or other bony parts. The occasional difficulty in firmly grasping the forceps above the lock with the left hand is easily met by looping a fillet or handkerchief over the lock and around the wrist.

THE USE OF ANIMAL TOXINS IN THE TREATMENT OF INOPERABLE MALIGNANT TUMORS.—(*Am. Journal of the Medical Sciences*, Aug.) Fowler reviews the history of this method of treatment. Fehleisen first applied this method, using pure cultures of the streptococcus erysipelatus, but his method found few followers on account of the limited number of cures and also on account of the danger of causing a fatal result. He afterwards tried the toxic products of the germs only, but found the result on the neoplasm to be almost *nil*. Sprouks carried on a series of experiments on animals and also on human subjects, and his results were that in a majority of the cases there was no change in the growth, in others they seemed to change a little, and a few were cured. He concluded that the toxic products of the streptococcus erysipelatus led to alterations tending to necrosis and absorption of the neoplasm. The mixed toxins of the streptococcus erysipelatus and prodigiosus are now employed exclusively. Coley has treated, up to the present time, 140 cases, of which 17 show a complete disappearance of the growth. Some of these have been four years without recurrence. There is some danger from this method, two fatal cases being recently reported. If, however, small doses, $\frac{1}{4}$ minim, at the start are used and cautiously increased until results are obtained, the danger is reduced to a minimum. Idiosyncrasy and susceptibility play a very important rôle. There is also danger in employing the toxin in cases where suppurative processes are in progress. In certain cases the patient becomes more and more accustomed to the intoxication and an immunity is established. In these patients little good follows the treatment. It is the patients who react to the toxins who show improvement. The changes in the tissue of the neoplasms seem to be in the

nature of a sloughing *en masse* or a rapid destructive degenerative process, simulating fatty degeneration. The exact method of the action of the toxins on the neoplasm is still a question of dispute. The old theory that the cure resulted from the high temperature following the injection and its influence on the vitality of the cells has been discarded. Those who hold the parasitic origin of cancer believe the effects are due to destructive action on the micro-organism. Repin propounded the theory that it was due to an elective intoxication of the cells of the neoplasm. Examples are seen in the affinity of tuberculin for tuberculosis tissue, also when a person is bitten for the second time by a venomous serpent, the scar of the former wound shows signs of irritation, as if the cells had retained a special susceptibility for this poison. This theory seems to offer the most rational explanation of the effects of these toxins upon malignant neoplasms.

TREATMENT OF TYPHOID FEVER WITH THE BLOOD-SERUM OF CONVALESCENTS.—(*Centralblatt für innere Medizin*, No. 35.) Dr. Walger recently treated four cases of typhoid fever with the serum obtained from convalescents. The first patient, a woman of 41 years, was extremely weak and emaciated. On the eighth day of the disease 10 c. c. of serum was injected. The patient appeared better within a short time. The following day the temperature was 101.3°, but there were no subjective symptoms. The spleen continued enlarged and a profuse roseolus eruption appeared on the abdomen. The temperature continued low, and on the fifteenth day the woman was practically well. The patient left her bed on the twenty-first day of the disease. The second patient, a feeble woman of 58, was given an injection of 10 c. c. of serum on the eighth day of the disease. The next day her temperature fell to 100.4°, and the following day was subnormal. On the fifteenth day she left her bed. The third patient, a vigorous girl of 21, apparently had a mild attack of typhoid fever, but in the third week the condition became much worse. On the twenty-fifth day 10 c. c. of serum were injected. No immediate results followed, but in the following week, after a period during which the temperature reached 105°, and there occurred a violent attack of vomiting, there was suddenly a profuse sweat and the patient seemed much better. Three weeks later, after a period of apyrexia of five days, a relapse occurred, which, however, was so slight that no serum was used. The fourth patient, a poorly-nourished woman of 34, was given an injection on the seventh day of the disease and it was fol-

lowed by a slight rise and then a steady decline by lysis to normal on the thirteenth day. Subsequently a typical relapse occurred and a second injection of serum was made. The temperature remained high for two days and then fell by lysis. Recovery was prompt and complete. None of these cases would ordinarily have been considered hopeful. In all the injection of serum was followed by a pronounced change in the general condition and by an unusually early disappearance of the fever. There seems also to have been a beneficial action upon the local processes. The fact that relapses occurred in two cases shows that both would have been very severe if they had not been treated with serum. The Widal reaction was not tried. All of the patients exhibited, sooner or later, the characteristic diazo-reaction.

HOSPITAL AND CLINIC NOTES, ETC.

A PAPILLIFEROUS CYST-ADENOMA.—At a recent meeting of the New Haven Medical Society, Dr. Hawkes reported the following case: A school teacher, a woman 39 years old, complained of pain during her menstrual periods. The trouble had been gradually increasing for years, and was, when Dr. Hawkes saw her, severe enough to incapacitate her for work at these periods. Upon examination a tumor was made out in the abdomen, a little to the right of the median line, and a cystic condition of the ovary diagnosed. An operation was performed and the right ovary removed. It was found to be the seat of an adenoid growth with some cystic formation. The operation was attended with considerable difficulty on account of the extremely wide and short pedicle presented by the tumor. At this same time some small cystic tumors of the left ovary were also removed. The patient had been allowed large quantities of morphia to relieve the pain, and it was some time before the drug could be wholly stopped; but aside from this she made an uneventful recovery.

In September, three months after the operation, it became necessary to tap the peritoneal cavity. A large volume of ascitic fluid was drawn off, and a tumor, extending from the left lobe of the liver nearly to the umbilicus, became prominent. At this time careful vaginal examination showed no change in either the stump of the right or in the left ovary. Tapping was again resorted to a month later, and after withdrawal of the fluid, the tumor of the liver was seen to be somewhat reduced

in size. This performance was gone through a third time with a still further reduction in the size of the tumor. On December 3, abdominal enlargement being again very marked, the cavity was tapped for the fourth time and a quantity of fluid, differing very markedly from the preceding specimens, was drawn off. Up to this time the patient's general health had remained remarkably good, so that there was no indication of a malignant growth being present.

A specimen of the fluid was sent to Dr. Kellogg of the Yale Medical School for examination. The sample as submitted consisted of a reddish brown fluid exhibiting, when held to the light, a considerable amount of a rather flocculent precipitate. The red hue was sufficiently pronounced to excite the suspicion of the presence of blood, or at least hemoglobin. The fluid was neutral in reaction, had a specific gravity of 1025, was highly albuminous and coagulable. Microscopically, the morphological elements were found to consist of a large number of red blood corpuscles in a good state of preservation, indicating a fresh hemorrhage, the usual number of colorless corpuscles, and filaments of fibrin, together with an immense number of cells of a peculiar type. Prominent among them were many single, non-nucleated, granular cells which have long been recognized under the name of the Bennett-Drysdale corpuscles, as almost pathognomonic of ovarian fluid or of fluid from an ovarian cyst. In addition to these there was an immense number of cell masses, some irregular and others arranged in sheets of circular outline and slightly concave as if derived from the tips of villi or papillae-like protuberances. The evidence thus presented, i. e., the high specific gravity, the large quantity of albumen and coagulum, together with the peculiar morphological elements above described, rendered the conclusion inevitable that the fluid under consideration was of ovarian or ovario-cystic origin. The absence, however, of a history of a present tumor of the ovary led to a consideration of the conditions that might be present.

The ordinary multilocular cyst of the ovary produced by cystic degeneration of a Graffian follicle, while in many cases presenting minute papillary outgrowths, must of necessity be excluded. The same may be said of the so-called unilocular cyst, said to be produced by the cystic degeneration of the main or horizontal tube of the parovarium. There remains, then, to be considered a tumor always originating at the hilum of the ovary in, according to Foulis and Coblenz, an abnormal prolongation into the hilum of the vertical tubes of the

parovarium and invariably giving rise to papillary masses, secretory in character, from their being morbid attempts at the reproduction of tubular glands. These papilliferous cyst-adenomata differ from the ordinary variety in that they must be considered at least semi-malignant, due to the fact that the villi or even the cells of which they are composed, if allowed to become free in the peritoneal cavity, attach very readily and there reproduce their kind *ad infinitum*, a form of local metastasis, or perhaps better, transplantation. These growths may become carcinomatous, and this fact has led Ziegler to apply to them the term of papillary cysto-carcinoma.

A consideration of the fluid together with the clinical history led irresistibly to the following conclusion: that we have to deal with a cyst of this character. A cyst whose boundaries are practically the boundaries of the whole peritoneal cavity and one secondary to a papilliferous cyst-adenoma that exists or has existed in the hilum of the ovary; that in some way the villi became free in the peritoneal cavity and, there, gave rise to countless numbers of growths similar in character to the parent, and that the fluid was not only a transudation and an exudation but also a secretion from the villi. The lack of cachexia in the patient is not at all remarkable when we consider that the growth, though malignant in so far as the results are concerned, is not a true carcinomatous infection, although it may become so. While the above tumors are not absolutely rare they are infrequent enough in this part of the country, at least, to deserve mention.

RUPTURE OF THE POSTERIOR MENINGEAL ARTERY FROM A BLOW ON THE HEAD.—Mr. X was brought to the New Haven Hospital December 18, at 4.30 p. m., with the history of having been thrown from a wagon half an hour before while intoxicated, striking on his head in the fall. The blow immediately rendered him unconscious, and there was bleeding from the right nostril. Examination on entrance found the patient in a comatose condition; pulse 48 and full; temperature 97°; respiration irregular and stertorous. The pupils were unequal, the right being dilated, the left contracted, and neither responded to light; the entire body was rigid. The head was shaved, and a slight abrasion was found over the right parietal eminence. There was no evidence of any implication of the bone. The usual treatment of an ice cap to the head, warmth to the extremities, etc., was employed. The condition remained the same until 6.30, when the patient vomited a dark brown sub-

stance tinged with blood. After this there was practically no change until 7.30, when it was found that his pulse was rapid and thready, reaching 160, respiration was exceedingly irregular, his face cyanotic, and there seemed to be an entire lack of muscular tone. It was necessary to hold the jaw forward to permit of respiration. This condition continued until 8.15, when respiration ceased entirely.

An autopsy was made thirty-four hours after death by Doctor Carmalt. The *rigor mortis* was very marked. There were no external abrasions upon the body except the one mentioned. The skull was opened in the usual manner. On removing the scalp and exposing the bone, nothing was seen externally except a few minute ecchymotic spots in the substance of the bone corresponding with the abrasion on the scalp.

The calvarium having been removed, the skull was found to be exceedingly thin, not more than one-quarter the usual thickness. Immediately an extra dural, firm, clot of blood was found under the squamous portion of the right temporal bone, about four ounces in weight.

On dissecting away the dura, it was found that the brain substance was compressed under this area. The vessels were deeply congested. When the brain was lifted out, a thin layer of extravasated, non-coagulated blood was found in the left posterior fossa. On looking for the source of the blood forming the clot, a fissure was found in the skull running almost perpendicularly, from a point corresponding to the origin of the temporal muscle, on the right side, to the base, directly across the sulcus for the posterior meningeal artery. An examination of the vessel itself, lying in the dura, disclosed a corresponding point of rupture. This fissure extended down to include the petrous portion of the temporal bone over the internal ear, and a thin spicule of bone was seen penetrating the middle ear. There was a considerable amount of extravasated blood around the fissure. The petrous portion of the opposite temporal bone presented a very similar ecchymotic appearance, except that there was no fracture, and blood was seen shimmering through the thin bone. On the lower surface of the left side of the brain, in the region of the anterior cerebral lobe, there appeared a point a little anterior to the left parietal eminence, and also another point, almost directly over the site of the abrasion of the scalp, of a bluish black hue, which on cutting into proved to be areas of extravasated blood into the brain substance. These were made up of small ruptured blood vessels penetrating into the brain one-quarter of an inch. A point of interest,

aside from the injury, was the discovery of the enlargement of the left posterior clinoid process. It projected fully half an inch farther than the one on the right side.

Thus there were two distinct lesions. One was a fissure of the skull near the base, at a distance from any apparent lesion on the outside, which involved a rupture of the posterior meningeal artery, undoubtedly causing death. The other was an evident injury to the brain, clearly from *contre coup*. The lesions in the petrous portion of the temporal bones were very unusual, and while the one on the right side would be naturally referred to the fissure, with which it was in apparent continuity, that on the left cannot be so explained. Whether this was due to a transmission of force around the circle of the skull, or whether it was due to the direct force of the body acting on the the base of the skull, the man falling on his head, are points for discussion; but certainly the lesion of the brain on the opposite side from the fissure in the skull can be best explained by the wave-like transmission of force involved in the explanation of *contre coup*. The extreme thinness of the skull is to be taken into consideration, also, in explaining the variety of the injuries.

FILARIA SANGUINIS HOMINIS.—The patient, a man aged 60 years, was admitted to the New Haven Hospital on December 18, 1897, in a semi-conscious condition. During the morning while at work he had fallen suddenly to the floor and was unconscious when assistance arrived. On examination the patient appeared rather plethoric. He was unable to speak, but appeared to understand questions. His head was turned to the left and there was ptosis of left eyelid. The pupils were contracted, but responded to light. The tongue was protruded, and could be turned to either side. The facial folds were symmetrical and the chest was puffed out on expiration. There was complete paralysis of left leg and arm with anæsthesia of these parts. The patellar reflex could not be obtained. The lungs were negative and respirations deep. Heart's action was weak. A systolic murmur, which was transmitted into the axilla, was heard at the apex, and a systolic murmur at the second right intercostal space was transmitted into the neck. The patient died December 21, the diagnosis of the case being cerebral hemorrhage. The autopsy by Dr. M. C. White bore out the diagnosis.

The body was well nourished, and the subcutaneous fat was abundant. In the thoracic cavity was a small amount of a clear yellow fluid. The heart showed a marked thickening of the walls of the left auricle and the cavity of the left ventricle was

slightly enlarged. The endocardium was paler and thicker than normal and there was a marked thickening and calcification of the flaps of the aortic valves. The heart wall was pale and contained small whitish streaks, and there was arteriosclerosis of the coronary arteries. Both lungs were adherent to the diaphragm and lower part of parietal pleurae, and both were dark red, containing much blood in the lower posterior part. There was no solidification and all parts seemed to contain air. The liver was slightly enlarged and paler than normal; on section the paleness was again noticeable and the lobules even more distended than usual. Microscopically, fat droplets were found here and in the heart muscle. The kidneys were both normal in size; the capsules slightly adherent, and left a granular surface when removed. The cortex was pale and there was much fat in the pelvis. Microscopically there was found a fatty degeneration of the cells. The spleen was slightly smaller than normal and firmer. The stomach, intestines and bladder were normal in appearance. The aorta showed thickened, yellow patches, especially around the mouths of its branches. In the brain, there was a considerable amount of a transparent gelatinous material in the membranes at the vertex. The arteries at the base showed many circumscribed areas of thickening, some of which were hard and calcified. On the right side in the pons was a mass of blood extending into the fourth ventricle.

The anatomical diagnosis was pontine hemorrhage of right side; chronic endocarditis, hypertrophy and dilation of left ventricle, old pleurisy of both sides, fatty liver, kidneys and heart, chronic interstitial nephritis and splenitis with general arterio-sclerosis.

Dr. C. W. Kellogg secured several specimens for study in the pathological department of the Yale Medical School and, some time later, when making a careful examination of a section from the kidney, discovered the presence of the *filaræ sanguinis hominis* in the blood vessels. It was then too late to make a complete case, for the brain had not been microscopically examined—the arterio-sclerosis having been considered sufficient to account for the hemorrhage—and the urinary analysis had been accidentally destroyed; but inasmuch as the parasite is rarely met with in these parts, the JOURNAL records all the obtainable data.

It was learned that for a long time the patient had been troubled with incontinence of urine and occasional attacks of dizziness. The other symptoms usually associated with the

parasite, such as lymph stasis, swelling of the lymphatic glands and elephantiasis-like thickening of the tissues, oedema and lymphangiectesiâ, etc., were never present so far as could be ascertained. This parasite is supposed to be confined to the tropics, but many cases have occurred in the southern part of the United States, and according to some reports they are endemic as far north as Charleston. In the present case the source of the infection cannot be definitely placed. The patient served in the civil war, one year going as far south as New Orleans, but since that time has worked as a clerk in New Haven.

Just how many of these lesions, revealed by the autopsy, were caused by the parasites, or how long they had been present in the blood, it is impossible to say. A careful examination of the blood, however, before the case reached the hospital, would have revealed their presence and permitted an attempt to relieve the patient, thus emphasizing the usefulness of blood analysis in doubtful cases. There are many theories as regards the treatment. Laveran reports a case of filaria which he discovered during life and treated successfully with quinine. This is repudiated by other authorities. Inunctions of mercurials have also been said to be effective in destroying the germ. But with the active presence of this parasite within the borders of the United States there is need of a clearer knowledge of its life history and treatment.

In the Springside Hospital there are at present a total of 438 inmates, which is the largest number ever present at one time. Of these, 300 are hospital patients, and 138 inmates of the dormitory. The total number of patients treated from December 1, 1897, to April 1, 1898, was 310, and during this period there were twenty-four deaths, or a mortality of 7.74%. Since April 1, 1898, when Dr. Crowe went on duty, to December 1, 1898, there has been a total of 583 patients treated, 156 discharges and thirty-four deaths, or a mortality of 5.83%. Besides the regular hospital patients, the number of dormitory patients receiving medical treatment average eighty per month. Two trained nurses have recently been placed in charge. They receive some assistance from such inmates as are competent to render aid, but their services are entirely inadequate for the needs of the institution. The operating room has been lately refitted by the inmates, and is now well equipped. It does credit to the hospital and the energetic work of Dr. Crowe.

We take pleasure in announcing the receipt of the forty-third annual report of the Executive Committee of the Hart-

ford Hospital. The work of the Hospital compares most favorably with that of previous years. The total number of admissions was 1,622 and the total number under care 1,783, making the daily average 158. The cost of maintenance per week was \$8.55 per patient. This is an increase over last year of 165 patients, and an increase in the average weekly expense of 29 cents. The increased receipts from paying patients shows that a better class is gradually seeking hospital treatment. A total of 63 soldiers were cared for, nearly all being typhoid fever cases. The increase in the rate of recoveries and decrease in the death rate is very encouraging. There were 588 operations performed, 80 more than last year, of which 38 were for appendicitis, and 79 were laparotomies. The gynecological patients numbered 155, and the number of births in the obstetrical ward were 121. Dr. Irving D. Blanchard, '97, and Dr. Heman A. Tyler, Jr., '98, have been appointed as internes during the year. There have been many improvements made, principal of which was the thorough renovation of the operating room. The funds of the Hospital have been increased over \$55,000 during the year in five bequests. The growth of the lying-in and gynecological departments necessitates the erection of another story over the children's ward. In connection with the Hospital is a Training School for Nurses, which graduated seventeen nurses in October. In the Old People's Home there were 73 inmates cared for during the year.

The following operations were performed at the New Haven Hospital, November 16 to December 11, inclusive. Dr. Carmalt was the attending surgeon:

Nov.	Dec.
16. Cystocele and uterine polyp, cured.	3. Carcinoma of superior maxilla.
17. Appendicitis, cured.	7. Crush of foot, cured.
20. Hip joint disease (1), improved. Hip joint disease (2), improved.	8. Diabetic gangrene of toe, improved.
23. Appendicitis, cured. Laceration of cervix and perineum, cured.	Hemorrhoids (1), cured. Hemorrhoids (2), cured.
25. General suppurative peritonitis, death.	10. Old dislocation of shoulder joint. Appendicitis, cured.
27. Metrorrhagia, cured.	11. Abscess of side. Compound fracture of femur.
28. Irreducible inguinal hernia, cured.	Metrorrhagia and lacerated perineum.

ITEMS OF INTEREST.

It is expected that the report made by Dr. Herbert E. Smith of this school regarding the contamination of the water supply at the Connecticut State Camp in Niantic, will result in the complete removal of the old well system, formerly in vogue. The plan for the future is to bring, by means of pipes, a bountiful supply of pure water, obtained from sources free from any possibility of contamination.

The American Association of Anatomists held its annual meeting in New York, on December 28 and 29, 1898. The session was, as usual, well attended, and the papers presented of the highest literary character, showing what an enormous amount of scientific research is being carried on in this subject.

A joint committee representing the various scientific societies of Washington has been formed, in view of the possible danger of a vote being given by the United States Senate making vivisection in scientific research illegal. The American Humane Society is to hold a meeting in Washington, and it is not unlikely that the anti-vivisection bill now pending in the Senate may be called up and perhaps passed.

The Board of Education of New York city has appointed for the whole city of New York nineteen physicians (among whom is one woman), whose duties it will be to examine teachers, who are now required to produce certificates of sound health before they are allowed to teach. Heretofore the teachers had to pay the physician's fee for examination; hereafter, however, the applicant may consult any one of the appointed physicians free of charge and the Board of Education will pay three dollars for each examination.

On November 9, 1898, Dr. E. B. Cragin, Professor of Obstetrics at the School of Physicians and Surgeons in New York city, performed successfully a Cæsarean operation. The child was removed in sixty-five seconds from the time of incision, and the wound was closed and the operation completed in twenty-eight minutes. The mother and child are now enjoying good health.

An unexpected illustration of dispensary abuse occurred at the City Hospital Dispensary in Baltimore, when a man who

had just applied for free treatment on the plea that he was unable to pay a physician, dropped dead, and in his pocket was found \$1,500 in notes.

Hospital accommodations for students of Harvard University have been made possible by a recent gift for that purpose by Mr. James Stillman, of New York, of \$50,000 for the erection of a suitable building, and an additional yearly payment of \$2,500 for four years in order to run it. The building will be of brick, fire-proof inside.

The city of New Haven is now providing a free examination of sputum in the case of suspected tuberculosis.

The regular examining committee of the Connecticut Medical Society has held eight special examinations during the year 1898, the last one November 8th. Seventy applicants were examined, five of whom were for midwifery only, seventy for general practice. Of the seventy general practitioners thirty-nine were found qualified, and twenty-one not qualified, and ten were conditioned. Of the latter, three were afterward re-examined and granted certificates. The results of the last examination have not yet been reported to the State Board. One of the rejected midwives was also re-examined and passed. This committee and the two other official examining committees have held a conference and decided to apply to the State Board of Health to appoint the time and place for examinations to be held only once in four months, namely, March, July and November; that all examinations shall be written in English; and that at least seventy-five per cent. of answers must be correct to enable the candidate to pass, but that conditions may be allowed if there are not more than two branches under a marking of seventy-five and the total markings not less than fifty, with re-examination at the expiration of four months.

Practitioners registered since June 1, 1898:

<i>Names.</i>	<i>Basis of Registration.</i>	<i>Where Registered.</i>
JUNE, 1898.		
Wm. J. Craig, M.D.,	Ex. by Conn. Med. Soc.,	Hartford
James E. Blake, M.D.,	" " " "	Greenwich
Henry P. Moseley, M.D.,	" " " "	New Haven
Chas. M. Williams, M.D.,	" " " "	Greenwich
Burton J. Lee, M.D.,	" " " "	New Haven
Wm. A. Hoyt, M.D.,	" Eclect. Med. Assoc.,	Greenwich
Burdett S. Adams, M.D.,	" Homeo. Med. Soc.,	New Haven

<i>Names.</i>	<i>Basis of Registration.</i>	<i>Where Registered.</i>
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JULY, 1898.

Chas. A. Monagan, M.D.,	Ex. by Conn. Med. Soc.,	Waterbury
Wm. T. Bronson, M.D.,	" " " "	Danbury
James J. Gleason, M.D.,	" " " "	New Haven
Martha R. Stillman, M.D.,	" " " "	Waterbury
Henry H. Pelton, M.D.,	" " " "	Middletown
Pauline Lehman (Midwife),	" " " "	Hartford
James J. McCarthy, M.D.,	" " " "	Naugatuck

AUGUST, 1898.

Homer F. Moore, M.D.,	" " " "	Torrington
Russell Hulbert, M.D.,	" " " "	Middletown
Chas. A. Rider, M.D.,	" " " "	Redding
Raymond Del Mas,	" Eclect. Med. Assoc.,	New Haven
Salvadore Parisi, M.D.,	" " " "	Southington
Vincenzo Delpiano,	" " " "	Greenwich

SEPTEMBER, 1898.

Henry E. Hungerford, M.D.,	" Conn. Med. Soc.,	Waterbury
Chas. T. Cutting, M.D.,	" Homeo. Med. Soc.,	New Haven
Chas. C. Osborne, M.D.,	" Conn. Med. Soc.,	New Canaan

OCTOBER, 1898.

Chas. L. P. Smith, M.D.,	" " " "	New Haven
Lewis B. Porter, M.D.,	" " " "	New Haven
James J. McLinden, M. D.,	" " " "	Waterbury
Edward A. Haire, M.D.,	" " " "	Derby
Louise Hasspacher (Midwife),	" " " "	Meriden
Chas. V. Webb, M.D.,	" Homeo. Med. Soc.,	Torrington
John J. Gailey, M.D.,	" Conn. Med. Soc.,	Watertown
John W. Coe, M. D.,	" " " "	Meriden

NOVEMBER, 1898.

Patrick J. Cassidy, M.D.,	" " " "	Norwich
G. L. Hunter, M.D.,	" " " "	New Canaan
J. N. McKone, M.D.,	" " " "	Hartford
E. R. Pike, M.D.,	" " " "	Sterling

ALUMNI AND SCHOOL NOTES.

The Catalogue of the Yale Medical School is now ready for distribution, and may be obtained upon application at the Dean's office.

The second lecture to be given under the auspices of the Yale Medical Alumni Association will be delivered by Prof.

Samuel Alexander, M.D., of Cornell University Medical College, in A1, Osborn Hall, Thursday, January 19, 1899. The subject presented will be "Disease of the Prostate Gland."

At a recent mass meeting of the Yale Medical School the Constitution of the YALE MEDICAL JOURNAL was amended. In the future the Board of Editors will consist of six men instead of five; at least one of these to be chosen at the end of his second year and serve during his Junior year as assistant business manager, with the expectation that he will succeed to the business managership in his Senior year. This offers an excellent opportunity for some second year man to earn a position on the editorial staff of the JOURNAL.

'80—Dr. J. Francis Calef, of Middletown, Conn., has been appointed Surgeon-General on the staff of Governor-elect Lounsbury.

'90—E. R. Baldwin, M.D., read a very interesting paper before the Climatological Association in Bethlehem, New Hampshire, September 1, 1898, on the subject of "Infection from the Hands in Pulmonary Phthisis."

'93—R. E. Peck, M.D., was married on December 27, 1898, to Miss Eva Seward, of New Haven.

'94—E. L. Kingman, M.D., has returned from South America, and will open an office at 1173 Chapel street.

'95—Albert L. House, M.D., was married Wednesday, November 30, 1898, in Cheshire, Conn., to Miss Florence Wheeler Lainé.

'95.—J. H. J. Flynn, M.D., has received the appointment of physician to the Fire Department in the city of New Haven.

'96—James S. Maher, M.D., has returned from Europe, where he has been pursuing the study of medicine.

'97—Joseph A. Cooke, M.D., has removed to Meriden, where he will open an office.

'97—T. D. Pallman, M.D., has recently returned to America, after having pursued studies in Germany, and will begin the practice of medicine in New Haven.

'97—Stanley R. Woodruff, M.D., has recently removed to Bayonne, N. J., where he has opened an office.

'97—Dr. H. L. Welch was married to Miss Anette Vail, daughter of the late Frederick Vail, of New York city, at noon, December 13. The wedding took place at the Church of St. Mary the Virgin. Dr. and Mrs. Welch sailed for Germany on the following Saturday in the Kaiser Wilhelm II., where the doctor will continue his medical studies.

BOOK REVIEWS.

Orthopedic Surgery.—By James E. Moore, M.D., Professor of Orthopedic and Clinical Surgery in the College of Medicine of the University of Minnesota, with 177 illustrations. W. B. Saunders, Philadelphia, 1898.

In this book of three hundred and fifty pages is given an imperfect resumé of Orthopedic Surgery as it is to-day. The work shows but little of original thought or knowledge, the more important facts being largely a rewriting of what has appeared in a rather better form in Bradford and Lovett and in Young. It is surprising that the author cannot find in the many and varied conditions which legitimately come within the scope of orthopedic surgery some scheme of classification which could help the general practitioner and the student, for whom the book is written, in a more systematic study of the subject. The author confines himself in treatment to the one or two methods which have been most successful in his hands, thus omitting and ignoring some more classical methods that have stood the test of time in the hands of others. The book has the advantage of being essentially a "one man book" and not a heterogeneous collection of articles from various authors. The article on Pott's disease is by far the best in the work. It is well written, concise, exhaustive, and shows the author's acute conception of the pathological, clinical and practical aspects of this many sided condition, while the articles on Talipes and Rickets scarcely do credit to the work. The author makes little attempt to enter the domain of the intricate pathology of the hip-joint, but in the treatment of Coxitis is quite thorough and comprehensive. An article upon bone tuberculosis independent of any particular joint would be a great addition to the work and help the student in appreciating the constitutional conditions to be met along with the local. It is rather surprising in this day to read of "a strumous or scrofulous patient," and also later of the "scrofulous era." The illustrations are exceptionally well selected and well executed, and some of them appear here for the first time. The book is well indexed and the mechanical part of the work unusually satisfactory.

C. A. T.

BOOK NOTICES.

Twentieth Century Practice. An International Encyclopedia of Modern Medical Science, by leading authorities of Europe and America. In twenty volumes. Vol. XV, Infectious Diseases. Edited by Thomas L. Steadman, M.D. Published by Wm. Wood & Co., New York.

Manual of Physiology, with practical exercises, by G. N. Stewart, M.A., D.Sc., M.D., Professor of Physiology in the Western Reserve University, Cleveland. In this book an attempt is made to interweave the formal exposition with practical work, according to the experience of the author, and is especially intended as a text book. Published by W. B. Saunders, Philadelphia.

A Text Book of Obstetrics. By Barton Cooke Hirst, M.D., Professor of Obstetrics in the University of Pennsylvania. Illustrations have been extensively employed, the majority of them from original photographs and drawings. Price, \$5.00 cloth; \$6.00 sheep—net. Published by W. B. Saunders, Philadelphia, Pa.

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ON THE PROGRESS OF NEUROLOGY.

BY LEWELLYS F. BARKER, M.B., TOR.,

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PATHOLOGIST TO THE JOHNS HOPKINS HOSPITAL.*

MR. PRESIDENT AND GENTLEMEN:—When invited by the President of this Association to deliver a lecture before its members upon some subject pertaining to the nervous system, I must confess that, while I appreciated deeply the honor conferred upon me, the prospect was associated with a certain degree of anxiety and trepidation. Unless a man is confident that what he has to say to an audience composed in large part of busy practitioners, will interest and encourage as well as instruct his hearers, I can conceive of no possible excuse which could justify his appearance before them. On turning the matter over in my mind, however, it seemed to me that to a body of men so interested in the more purely scientific side of our profession that they support and attend each year a course of lectures upon scientific subjects related to medicine, a brief review of the methods which have been and are being employed in neurological investigation, together with an epitome of the main results thus far achieved from their application, could scarcely fail to be entertaining and helpful.

Indeed, on further consideration, and especially in the attempt to arrange the available matter in a more or less orderly fashion, it has struck me that the marked technical progress made and the enormous widening of knowledge concerning structure

* An address delivered before the Yale Medical Alumni Association, December 15, 1898.

and function with regard to the nervous system more than any other part of the human or animal body are peculiarly fitted to arouse enthusiasm and compel the admiration of the practical man.

In the brief time at my disposal it would be folly to attempt any minute description of technical methods or any laborious analysis of the details of individual original investigations. Such circumstantialities find a suitable repository in the special journals and reference volumes, not in a general lecture. I shall rather attempt, therefore, to indicate as succinctly as possible the broad lines of development and expansion of neurological technique, to point out the relation of modifications of old and inventions of new methods to the successive discoveries in neural morphology and physiology, and, possibly, to make some references to the probable lines of advance in the future. In the course of my remarks I shall have something to say with regard to the combination of instruction with investigation in the study of the nervous system, the importance of division of labor and co-operative activity, and the desirability of the association of well-organized laboratories in which anatomical and physiological researches are undertaken with well-equipped hospitals and asylums manned with clinicians thoroughly trained in the modern methods of investigating disease.

It will be simplest to begin by a glance at the conception of structure and function entertained by investigators at present, and afterwards to consider briefly some of the methods by which this conception has been gained.

The human individual as a member of modern society and the product of civilization is an animal manifesting physiological activities more complex and diversified than those of any other member of the animal series, and far more intricate and varied than those of the primitive tribes still to be met with in certain parts of the world. Between the most complex of animals and the simplest Protozoan species extends a series of organisms representing a scale of complexity of form and function most delicately graded. Common to every member of the series, though varying in constitution, is the substance which for want of a better name we call protoplasm. Equally common throughout the animal kingdom are certain fundamental activities—the capacity to assimilate food stuffs, to get rid of excrementitious products, to react to stimuli emanating from the environment, to give rise to other organisms of the same kind. As every one knows, however, the amount of protoplasm and the way in which it is distributed varies enor-

mously in different animals; it is also a matter of every day experience that the fundamental properties of protoplasm are by no means identical in their manifestations in the different species of organisms. Morphological differences are constantly correlated with physiological distinctions. In the lowest forms of animals the protoplasm exists as a simple continuous mass—a cell—containing within it certain more differentiated and apparently more solid masses—the so-called nucleus, centrosome and archiplasm. In all higher animals the protoplasm, at the beginning of the animal's life, is also met with in the form of a continuous mass, the fertilized ovum, a single cell, containing within it, nucleus, centrosome and archiplasm; this unicellular condition does not, however, last long, for by a repeated process of division the single protoplasmic mass becomes broken up into, first, two cells, then four, then eight, and so on until ultimately in an animal like man, according to the estimate of Francke, there are as many as $26\frac{1}{2}$ billions of cells. The original relatively simple minute microscopic lump of protoplasm has by assimilation of suitable food under favorable conditions grown into a manifoldly divided mass of protoplasm and protoplasmic derivatives weighing say 150 pounds or more. I shall not stop to discuss the factors, external and internal, which are operative in this gradual process of protoplasmic growth and subdivision, interesting as such a discussion could be made, but shall simply remind you that as the subdivision proceeds groups of the masses which result begin to exhibit structural peculiarities which distinguish them from one another, and which are markedly different from those of the common mother-cell.

The body, as we are accustomed to say, becomes differentiated into a number of groups of cells—the cells of the individual groups resembling one another closely, but differing strikingly in microscopical appearance from those of other groups. As a result of this manifold subdivision of the living substance, certain of the cells have come to be in more intimate contact with the external world than others, some are closer to the supply of crude food, some are exposed directly to light and air, etc. Cavities form, intercellular substances, solid and fluid, are manufactured and the organism is now a multicellular mass, of which the individual cells or individualities of a lower order are so related to one another and so co-ordinated in their activities that the whole animal appears to act as a unit—is indeed a unit or individuality of a higher order. The life of the higher unit “is not, however, an indivisible unitary archeus

dominating, from its central seat, the parts of the organism, but a compound result of the synthesis of the separate lives of those parts," i. e. of the separate lives of the organic individualities of a lower order.

The cells of a higher organism, though individuals, are not, in a sense, as independent as are free unicellular organisms. They represent, on the contrary, individual members of a great cell-state, in which the principle of physiological division of labor holds, and in which each individual to a greater or less extent affects and is in turn affected by every other individual of the billions which constitute the state. The reciprocal influences vary enormously according to the position and nature of the individual cells; some cells touch one another, some are directly united with adjacent cells by means of protoplasmic bridges, others are brought into relation with widely distant cells by means of extremely long protoplasmic processes or with the help of delicate fibrils the product of the activity of the protoplasm of the cells; while through the lymph and blood, which can carry chemical substances in solution, every cell is placed in a position to act upon or to be acted upon by any other cell in the body.

Though in the physiological division of labor each of the individualities of the lower order sacrifices in a certain degree its independence, yet it is in this way alone that it is possible for it to attain to a specialization of function, and had it to care for all the exigencies of the life of an independent isolated organism it could not long continue its existence in its peculiar condition. It is only by virtue of its membership in a well-organized state composed of a multitude of individuals divided into groups of workers of various sorts that it can with safety follow, as it were, "its own bent" and attain to a high degree of perfection in its own specialized physiological activity. The whole multicellular organism, on the other hand, can maintain a normal existence only when each individual group of workers functions in its proper time, place and intensity so that the sum total of the activities of the various specialized group of workers is just sufficient for the "continuous adjustment of the internal to the external relations" of the organism; in other words, all goes well only so long as the activities of the various parts maintain collectively a certain equilibrium.

But it is not to be thought that in the differentiation of the multicellular organism into organs and tissues, each cell in developing a special function loses entirely the general fundamental properties of protoplasm; on the contrary, each of the

specialized individualities retains the power to assimilate food, to give off excrementitious substances and often the capacity of reproducing its like; the difference in capacity is one of degree rather than of kind. The specialized cell may not be capable of digesting crude food stuffs; it may require that its nutriment be especially prepared for it by other cells or even by a whole series of other cells of different varieties. Again, the excrementitious products of a specialized cell may not consist of substances that can be directly eliminated by the body; very often doubtless other cells have to carry the process of combustion and analysis further; indeed, the excrementitious product of the former cell may constitute a suitable article of diet for the latter.

The various groups of cells in the human body so curiously differentiated morphologically in correspondence with their specific physiological activities are already well known to all of you. The great group of cells of hypoblastic origin have been set apart for purposes of digestion and respiration; they build zymogens, acids and alkalies and pour them out into the alimentary canal, where they mix with the food and prepare parts of it for absorption and utilization by the other cells of the body, or, as in the lungs, they mediate the gas-interchange between the air in the pulmonary alveoli in contact with their distal surfaces and the corpuscles and fluids of the blood situated proximal to them. The mesoblastic cells build intercellular substances and form the framework of the body upon which the soft parts are hung. Some of the intercellular substances become calcified and in the form of bone supply "struts and ties for the bearing of thrusts and tensions;" in other instances the intercellular substances are firm but elastic and supply the resilient material suitable for the articular surfaces of joints. Other mesoblastic cells build fibres of various sorts—long, tough, non-extensile fibrils as in tendon, aponeurosis, and ligament—elastic fibrils as in areolar tissue or the extremely delicate mesh-work of finest fibrils such as those met with in the fine meshed reticulum supporting the parenchymatous elements of the various organs. In the muscle cells we see the embodiment of a special function of high dignity—contractility. In the protoplasm of these cells are laid down certain longitudinal structures—plasma products—which look like fibrils often with curious cross-markings—structures which are undoubtedly associated in some way, though we are yet ignorant how, with the approximation of the two ends of the fibre when the latter is stimulated. The cells of ectoblastic origin become divided into

various groups, some of them forming a superficial covering for the body and certain appendages of that covering as hair and nails, others entering the orifices to provide them with a lining, still others dipping down beneath the surface to build the secreting glands which elaborate the milk, the sweat and the sebum.

A very large proportion of the ectoblastic cells—brothers or sisters of the epidermal cells—become especially differentiated along the lines of irritability and response and go to form the central nervous system, the axis cylinders of the peripheral nerves, and the true nervous elements of the various sense-organs.

The nervous system, as we know it to-day, consists like all the other tissues of the body of an aggregation of cells and of intercellular substances derived from the cells. Aside from the covering membranes and the blood vessels with the tissue immediately surrounding them in the central nervous system, and the connective tissue, blood and lymph vessels and neurilemma sheaths of the peripheral nervous system, all the cellular elements and intercellular substances of the nervous tissues are believed to be derived from this ectoderm or outermost of the three layers of which the embryo is composed at an early stage.

These cells and intercellular substances of ectoblastic origin in the nervous system may be divided into two great classes: (1) that including the true nerve cells and their derivatives, and (2) that including all the other cells in the central nervous system and their derivatives, namely, the elements classed as neuroglia and ependyma. Thanks to the newer investigations the form relations to be met with in connection with these two groups are gradually being unravelled, and it is to an epitome of our knowledge concerning these that I wish to direct your attention particularly this evening.

One of the most striking differences between a nerve cell and most other cells of the body is the curious distribution in space of parts of the protoplasm composing it; while a subdivision of the peripheral parts of the protoplasmic mass with formation of cell processes does occur in several tissues of the body, nowhere else is this subdivision so pronounced, nowhere are cell processes so long, so complex, and so manifoldly branched and so ultimately delicate as in the nervous system. Indeed, for a long time these intricate subdivisions of processes and many of the very long delicate processes were not known to constitute integral parts of nerve cells, and it was not until

they became recognized as such that the cell doctrine could be satisfactorily applied in the nervous system. To distinguish the whole nerve cell, inclusive of all its processes from the torso recognized by the older observers as the nerve cell, Waldeyer has introduced the term *neurone*, a designation which has met with almost general adoption. While I shall speak of the specialized cell-individuals in the nervous system as neurones, I do not mean to imply that we meet here with structures incomparable to other cells in the body; on the contrary, the neurones or complete nerve cells are individualities of a lower order quite comparable with other individualities of the same order, e. g. with gland cells, smooth muscle cells, tendon cells and the like. In the case of the neurones, the special labor performed has to do with the functions of irritability and conductivity; in the gland cell the most manifest functional capacity is secretion; in the muscle cell, contractility; in the tendon cell, the manufacture and nutrition of firm fibrils for mechanical purposes. In every instance we may assume that the structural peculiarities met with correspond to the physiological functions to be performed, although as yet we may be unable to correlate all the details of structure with their corresponding details of function.

Nearly all the nerve cells or neurones possess more than one process; indeed, in most there are many processes, though in some cells only two exist. In the cells with many processes the latter are found as a rule to consist of two sorts: (1) much branched processes never extending to very great distances from the main mass of protoplasm of the cell, processes which come off by a rather thick wedge of origin from the main protoplasmic mass, branch manifoldly soon after leaving the cell and soon exhaust themselves by multiple division, and (2) longer slender processes, each one arising from the principal protoplasmic mass by a narrow wedge of origin and extending for a shorter or longer distance, maintaining or nearly maintaining its original calibre on the way and giving off in its course only a few delicate side fibrils or collaterals. Ultimately it, like each of the side fibrils, divides several times and exhausts itself in delicate terminal arborizations—the so-called telodendrions. To the first set of processes, usually multiple, the term “dendrites” is applied; to the second set of processes usually, however, single for one nerve-cell, the name “axones” has been given. That there are neurones free from dendrites, and that there are others entirely devoid of axones need not detain us here, nor need we at this time con-

sider the elaborate nomenclatures which have been introduced for convenience of description of certain peculiarities of number, distribution and function of neurones in various parts. One important point, however, must be mentioned, viz., the axones of the various neurones differ enormously in length. Thus, whereas some axones are very short, extending for perhaps only a few millimetres, or even for a fraction of one millimetre from the cell-body, others are much longer, extending even to many centimetres, and in extreme instances for a distance greater than half the whole length of the human body. The neurones with long axones have been called by Golgi cells of Type I, and those with short axones cells of Type II. They are, perhaps, better designated with von Lenhossék as inaxones and dendraxones. The classification is merely a matter of convenience, since transitional forms exist. It is interesting to note that the long axones become surrounded during development by a myelin sheath, while the short axones are not thus enveloped. Outside the central nervous system, the axones of the cerebrospinal neurones are surrounded, not only by a myelin sheath, but also by a cellular sheath, the neurilemma, while the sympathetic axones are devoid of myelin sheaths, but retain a partial cellular covering. The axis cylinder of every nerve fibre is in reality but the axone of some neurone, that is, a long drawn out process of the protoplasm of a nerve cell. The perikaryon of a neurone, that is, the main protoplasmic mass containing the nucleus and its dendrites, does not become surrounded by myelin sheaths, but, in certain instances, at any rate are enclosed in an external reticular covering of peculiar structure, resembling, as has been suggested, a stocking drawn over the protoplasmic mass.

The main mass of protoplasm or perikaryon with its contents, together with all its dendrites and their subdivisions, the axone with its side fibrils, collaterals and end ramifications constitute, then, a single nerve cell, or neurone, that is, the particular form of individuality of the lower order met with in nervous tissues. It is estimated by Donaldson, of Chicago, that of the $26\frac{1}{2}$ billions of cells in the human body, some three thousand millions are nerve cells, an estimate which, as I have suggested elsewhere, if, of necessity, not quite accurate, is rather below than above the truth.

While the nerve cells or neurones are strikingly uniform in general external morphology, still microscopic examination shows that the length, mode of branching and size of the cell processes, together with the relation in which they stand to

the cell body, affords ample opportunity for the production of varied appearances, and in the different groups of nerve cells (for as might be easily imagined even among specialized workers belonging to one colony, where the colony contains thousands of millions of individuals, there is further specialization, division of labor, and accordingly formation of multiple sub-groups), one meets with structural peculiarities which permit a skilled histologist to decide, even from the external form alone, as to the particular group to which a given neurone belongs. Thus, in the diagram, no difficulty is encountered in distinguishing a pyramidal cell of the cerebral cortex, from a Purkinje cell in the cerebellum, a motor cell from the ventral horn of the spinal cord, or a cell from a spinal ganglion.

The researches of the cytologists, in addition to supplying us with data concerning the form of the outside of the neurones and their processes, have added a wealth of detail concerning the internal structure. Each neurone, like every other cell individual of the same order, contains a nucleus with one or more nucleoli embedded in the protoplasm. In addition, in many nerve cells the existence of centrosome and archiplasm has been demonstrated, and it is not impossible that all nerve cells contain these peculiar differentiated structures. In nearly all nerve cells, after treating with fixing reagents, the protoplasm of the dendrites and of the perikaryon can be seen to be made up of at least two substances (aside from the so-called pigment met with in many nerve cells); (1) a substance consisting of very minute granules, arranged in masses which have the form of dots, rods, spindles, wedges or cones, the so-called Nissl bodies, tigroid masses, or chromophile corpuscles; these show an especial affinity for certain dyes, contain iron and phosphorus, and are soluble in alkalies, and (2) a ground substance, in the fresh condition, and by some methods of preparation almost homogeneous in appearance, stainable by an entirely different set of dyes, resistant to weak alkalies, but digestible in artificial gastric juice.

There is a good deal of evidence that the first substance, that corresponding to the Nissl bodies or tigroid, is present in the living cell in solution, that it is allied in composition to the nucleo-albumins, and that it represents in large part the food supply of the nerve cell. The fact that it is present in about the same quantity and distribution in nerve cells of the same group, and that it varies considerably in quantity and distribution in nerve cells of different groups, when studied by a particular method, makes it of high importance for the anatomy

and pathology of the nerve cell. This substance is present in the perikaryon and dendrites, but no ascertainable amounts of it exist in the axone or in the portion of the perikaryon directly continuous with the axone, the so-called axone hillock. It must be extremely labile, for the quantity and distribution can be speedily and remarkably altered by insults of various kinds, mechanical, chemical or thermal, applied to any part of the neurone. It may even be made to entirely disappear from the nerve cell for a while, to return again some time after the cause of the disturbance has been removed. No direct relation, however, between the symptoms manifested by the animal as a result of the insult and the change in this tigroid substance can at present be made out, for on the one hand the symptoms may be out of all proportion to the changes recognizable in this substance, and on the other the alterations in the substance may continue for a relatively long period after the unusual symptoms have disappeared.

The structure of the second substance, that which we have spoken of as the ground substance of the nerve cell protoplasm and sometimes referred to as the "unstainable substance of Nissl," is as obscure as is that of protoplasm in general. In the perfectly fresh condition it seems to be under the highest oil immersion lenses quite homogeneous, but that it is not entirely homogeneous is rendered likely by a consideration of the effects of certain reagents upon it. Thus it is easily vacuolized, and the vacuoles when formed, though varying in size with the different reagents which can be employed, tend to recur in the same variety of nerve-cell constantly in the same arrangement. Thus the character of the vacuolization differs in the dendrites from that in the main protoplasmic mass, and the vacuolization in both dendrites and perikaryon is again very different from that of the axone. In such vacuolized preparations, certain particles, sometimes lying in the vacuoles, more often lying in the protoplasmic walls intervening between the vacuoles, can be stained by suitable dyes. These are the so-called neurosomes, and they also differ much in number and arrangement in the various parts of the neurone, being most abundant apparently in the protoplasm of the terminal ramifications of the axones and collaterals.

By special methods of fixing and staining, fibrils have been observed from time to time inside the ground substance; some of these are doubtless identical with the walls of the vacuoles seen in other preparations. Recently, however, very definite fibrillary appearances have been demonstrated inside the neu-

rones of both invertebrate and vertebrate animals, and it would appear that these represent special morphological entities differentiated from the rest of the nerve cell protoplasm. In invertebrates coarser fibril-like structures running through the axones and dendrites of neurones are described as breaking up in the perikaryon into a relatively large number of simpler fibrils, which anastomosing freely with one another unite to form intricate intracellular networks. In human nerve cells, by a somewhat different method, similar fibrils can be demonstrated in the processes, and in the perikaryon, but, it is said, without the formation of anastomoses or networks. Single fibrils can be traced through the perikaryon from a dendrite to an axone or from one dendrite to another dendrite of the same neurone; it is even stated that a fibril running for some distance toward the perikaryon in one branch of a dendrite, may before reaching the perikaryon turn back into another branch of the same dendrite and run in the opposite direction.

With regard to the ground substance of the nerve cell protoplasm, morphological knowledge is far in advance of explanations of physiological significance. Certain it is that this ground substance is of the highest importance for the nerve cell functions—certainly of infinitely greater importance than the stainable substance of Nissl. For while the latter can be markedly disintegrated or even obliterated from the nerve cell structure, and yet complete recovery follow, any pronounced general alteration in the ground substance is inevitably followed by complete degeneration and death of the whole neurone. Certain portions of the ground substance may, it is true, be destroyed without necessarily causing the death of the whole nerve cell; indeed, disintegration of all the ground substance forming that portion of an axone distal to the lesion when an axone be cut need cause no permanent injury to the neurone; the portion of the neurone which remains may regenerate the part removed.

We feel tolerably certain from recent experience, that the ground substance of the nerve cell protoplasm is the portion of the neurone more especially concerned in the nerve functions proper, but whether it acts as a whole, or whether, as would seem more likely, the structures differentiable in it, such as the neurosomes and fibrils, are of different physiological significance than the more homogeneous parts, the data at our disposal do not permit us to decide. Some investigators have been tempted, very naturally, I think, to assume that the fibril-like structures in the ground substances represent the essential con-

ducting substance, but, however plausible, this is not yet satisfactorily proven, and even if such structures were shown to be particularly suited for conduction, a similar function for other parts of the nerve cell protoplasm would be by no means excluded. In passing it may not be superfluous to remark that, lucky as we should be to establish clearly the element or elements actually concerned in *conduction* in the nervous system, such establishment would refer to only one feature of neuronal function, and the capacities other than those of mere conduction would have to be subsequently considered. Time will not permit me to enter into a discussion of the morphological and physiological facts which have been accumulated with regard to the nucleus; it will be sufficient to say that they are probably just as important, if not more important, than those of the protoplasm, and that as yet our knowledge of them is even less complete.

A word as to intercellular or interneuronal substances inside the central nervous system. I have already spoken of the periaxonal myelin, and have referred to the reticular investment of the perikaryon and dendrites. That the blood capillaries give off a nutrient fluid which bathes the nerve cells there can be no doubt; that the neurones throw off excrementitious substances into the lymph is just as certain. Whether in addition to this lymph, and the products of the neuroglia and ependyma, there are besides the perineuronal myelin and reticular investment any formed intercellular substances derived from the neurones, we do not know. The majority of investigators at present are opposed to the assumption. For the neuropilum of invertebrates, however, it is asserted that fibrils similar to the intraneuronal fibrils exist entirely free, and a well-known German neurologist has recently made a strong plea in favor of the view that in the grey matter of the central nervous system of vertebrates, and especially of man, similar extraneuronal fibrils exist in large numbers, and are accountable for the peculiar stamp which the grey matter bears. From what we know of other tissues in the body, and from what we have learned of the fibril-building power of neuroglia cells, the existence of such intercellular substances in the nervous tissue is not incomprehensible, nor would the demonstration of their presence be a matter of surprise. Thus far, however, this demonstration is lacking and we need scarcely worry ourselves concerning the possible function of such hypothetical substances before their existence has been proved. That the bringing of such proof could fundamentally alter our general conception of the struc-

ture of the nervous tissues or of the body as a whole, I find difficult to conceive, for as every histologist who has worked with the tails of rats, the ligamentum nuchae of the ox, a piece of hyaline cartilage, or a mass of bone, knows, the occurrence of an intercellular substance is no strange phenomenon and exercises no restraining influence on the formation of the idea that the body essentially consists of a mass of cells or individuals of a lower order, united and co-ordinated into a single individual of a higher order—the whole organism.

It would take too long to review even briefly the main facts concerning glia cells, ependyma cells and glia fibres. An epitome of the changes which the nerve cells undergo in the body of the embryo and after birth before they have assumed the form met with in the adult must also be omitted. That in early stages the nerve cells are devoid of processes, are motile, and multiply by karyokinesis are now well-known facts. Independent of one another and wandering from their birth-places, the neurones gradually develop their wonderful processes, first the axones, later the dendrites and finally come to occupy, some of them sooner, others later, the localities in which they are destined to spend the remainder of their lives.

So much for the modern conception of the histological units in the nerve tissues. The neurologist is in possession, however, in addition to the special knowledge which concerns these units or individuals, of much valuable information bearing upon the inter-relations of the units, the way in which they are grouped, the possibilities of reciprocal influence not only among members of a single group, but among the groups themselves, in short, the architecture of the central and peripheral nervous organs. He sees how that among an enormous number of individuals, of the order of body cells in the process of physiological integration which leads in normal animals to a united functioning as a higher and more complete vital series of units morphologically and physiologically intermediate have arisen. Neuronal mechanisms are combined to neurone-group mechanisms, neurone-group mechanisms are combined in turn to give rise to mechanisms of still higher orders, until finally the whole nervous system is included. The latter, constantly acting upon the rest of the body and its environment, and in turn being influenced continuously and rest of the body and its environment, we stand face by face with the organism as personality.

It would take many lectures of the time allotted to this to deal with the features of this organization with which we are already

familiar. For we should have to consider the gradual transition in the organismal series from unicellular animals, in which the response to a stimulus has to be made by the same cell which receives it, through a long chain of ever increasing complexity in which there is dissociation of the primary stimulus from the ultimate response and the intercalation between the two of one, two, one hundred or perhaps many thousands of neural activities. In multicellular organisms with the increase of functional complexity there is corresponding increase in the number of special laborers, and progressive dissociation of the function with distribution of special tasks among these laborers. A brain appears, a general movement center in connection with one or more organs of special sense (Steiner). In the highest of animals, consisting as he does of a large number of partially fused segments, each segment fitted out with a relatively independent sensori-motor apparatus formed architecturally of a set of receptive neurones closely related to another set of discharging neurones, the individual segments in turn being manifoldly united by commissural and association neurones with one another and with higher groups of neurones, we meet with the acme of dissociation of neural function combined with the highest known order of complex unitary neural capacity.

We are learning to recognize the anatomical mechanisms which account for the fact that the application of sensory stimuli to the skin or tissues belonging to a primitive segment, while primarily influencing by way of neural channels, the musculature or the secreting glands of the same primitive segment, may secondarily excite similar tissues of adjacent or even widely removed segments; for the fact that the same sensory stimulus which sets free reflexes can also play a part in the origin of an instinctive reaction or even enter as an important component into the genesis of a voluntary act; for the fact that groups of elementary sensations resulting from stimuli originating in the body itself or in the external world can be united into physiological units of higher orders, into feelings or emotions, into more clean-cut perceptions and even into abstract ideas and conceptions; and also for the fact that subconscious afferent impulses, strong feelings and mature reasoning can all excite motor discharges, in the one case suddenly as an immediate and necessary response to the stimulus applied, in the second instance less promptly perhaps and modified by intercurrent factors, and in the last event more slowly with the manifestation of all the characteristics of a deliberate choice.

I say we are learning to understand these anatomical mechanisms, for I do not mistake the beginning for the end. What we know is but the threshold to that more complete knowledge, the treasures of which contemporary neurologists are beginning to catch a glimpse. Fortunately for medicine and for mankind this threshold is that of an "open door," entrance to which is barred by no political constitution or jealous state enactment; portions of the wealth beyond are available to any one who possesses natural aptitude, and who, approaching it with reverence, interest and industry, is willing to make his aptitude of value by submitting for a time to that rigorous training by which alone it is possible to acquire the necessary technical skill.

This brings me naturally to the discussion of the methods of neurological investigation that have led to that knowledge of the nervous system which we already possess, and that together with new methods, sure to be discovered as we continue to work conscientiously with the old ones, are destined to expand our views, to open up new neurological vistas and to illuminate those now seen only in the dawn.

On examination it is, perhaps, not surprising to find that these methods can be divided into two groups which stand in intimate relation to the two aspects of function which we have learned to distinguish in our study of the nervous system. We have seen in this system how through the subdivision of the labor among a large number of individuals there has arisen a marked dissociation of functions, and how through fusions of the activities of dissociation-mechanisms the higher and higher unitary physiological activities are to be accounted for. In the study of the nervous system, also, methods of dissociation or analysis have to be combined with methods of integration or synthesis in order that the most satisfactory results in either morphology or physiology can be reached. It is a universal experience that in the progress of acquiring knowledge analytical methods precede the synthetical. There must be differentiation before integration. Now, while a whole series of analytical methods have been in use for a long time and have of late been wonderfully refined and rendered extremely delicate, it is striking that there are but few synthetical methods, and those that have been employed have been relatively crude, the better methods having been used only by a limited number of investigators.

I shall not be so inconsiderate as to detain you by describing, even briefly, the technique of the various methods which have

been and are still helpful, but shall be content with recalling to mind the special advantages of the principal ones and, perhaps, the names of the investigators deservedly associated with some of them. What I shall say in this connection will bear solely upon morphological studies.

The earliest workers occupied themselves mainly with describing the gross form relations of the central and peripheral nervous systems as revealed on simple exposure by removal of the bony and membranous coverings or by cutting into the organs. The shape of the principal masses and cavities, the existence of white and grey substance, the distinction of the cerebrospinal and sympathetic nervous systems and certain gross pathological alterations were early known and described. Coincident with the increased study of human material and greater skill in the use of the scalpel the descriptions become gradually more accurate until in the records left behind them by such men as Sylvius, Vesalius, Monro, Sir Charles Bell, Lockhart Clarke, Reil, Rolando, Burdach and Stilling, we cannot but marvel at the accuracy of observation and the faithfulness of portrayal which they manifested.

The introduction of hardening fluids facilitated the study of gross material and by preserving the tissue from decomposition permitted the prolongation of the examination of a single specimen indefinitely. Thick slices of the hardened tissue yielded in many respects more satisfactory information than that derivable from slices of the fresh soft organs. Alcohol hardening permitted of successful manipulation with fingers and forceps and the newer conceptions gained with the aid of the *Abfaserungsmethode* were at the time justly lauded. In this connection the work of Burdach, Reil, Foville, Stilling and Meynert deserve especial mention.

Late in the last century and early in the present the method of isolation of parts was pushed further, especially when the microscope came into more general use and methods of teasing with needles and of loosening the parts from one another by means of fluids which soften or dissolve out certain of the substances which ordinarily prevent dissociation were introduced, and the knowledge of the nervous organs became within a relatively short time enriched to an unprecedented degree. The details made out concerning isolated nerve cells and their processes and separated single nerve fibres and their coverings by these relatively simple manipulations were truly remarkable. The histologists of the time attained to a degree of skill in this field which would give the blush to the modern histologist

did he attempt to imitate them. In this connection Wagner, Deiters, Max Schultze and v. Kölliker, are the names one thinks of. The student of neurology to-day will do well if he do not despise or neglect a form of examination which affords pictures of the parts obtainable by no other means.

As early as 1824, Rolando had cut sections of the nervous system and examined them under the microscope. It was in 1842, however, that Stilling, having cut a frozen section of the spinal cord and recognized the ease of the study of relations inside it, exclaimed "eureka" and caught a glimpse of the great possibilities of the application of the method of the study of *serial* sections. Since then microtomes have been invented and wonderfully improved, satisfactory methods of embedding have been devised, and now it is possible to cut the whole brain of an adult man into faultless serial sections in any one of the three dimensions of space without loss of a single section. Recently Flatau has shown that it is possible also to divide the whole spinal cord into longitudinal serial sections. By means of absorption, embedding, serial sections of one or a few nerve cells can be obtained as thin as one micron or even less.

Next in importance to mechanical subdivision of the nervous system into its morphological elements and into extremely thin slices, was the invention of the method of differentiation by means of the application of coloring matters of various sorts. The carmine method of Gerlach in connection with bichromate hardening of the tissues not only differentiated the nuclei of the nerve cells from the protoplasm in which they were contained, but by showing a special affinity for the axis cylinders of the nerve fibres rendered them easily distinguishable in sections from investing sheaths and from neuroglia elements. The impregnation with chloride of gold also revealed minute nerve fibrils and processes of nerve cells which must have appeared most remarkable to those who, studying tissues, prepared them in this way for the first time.

Of even greater importance was the introduction of Weigert's stain for myelin sheaths which made it possible to follow bands of medullated fibres or even single medullated fibres for long distances in the central nervous system and in the peripheral nervous system. The method is valuable not alone for the study of the adult nervous system of man and animals in health, but because in diseased conditions it also gives information of the very highest import, since in areas in which the medullated nerve fibres have undergone degeneration from any cause and have been absorbed, the absence of bundles of myelin sheaths

from positions in which they normally exist is demonstrated in a superb manner. And while the extremely delicate method of Marchi will indicate the existence of degenerated nerve fibres at a much earlier period than that corresponding to the total absorption of these fibres, and is accordingly a boon to the experimental investigator, it can never entirely replace Weigert's method for the study of degenerations. Indeed, in human pathological anatomy the two methods supplement one another most conveniently.

As a special application of Weigert's myelin sheath stain may be mentioned Flechsig's studies of the developing nervous system. The discovery of the fact that the bundles of medullated nerve fibres which exist in the adult nervous system do not all receive their myelin sheaths at the same time, but get them rather at successive intervals corresponding more or less accurately in serial appearance to the successive manifestation of more and more complex functional activities, gave the clue to the embryological analysis of the medullated tracts, which having thrown and still throwing so much light upon the architectural characters of the spinal cord and brain, will always be associated with Flechsig's name.

The latest results of this application of this method has resulted in Flechsig's hands in the better localization of the primary sensory motor areas in the cerebral cortex, in the demonstration of the fact that the projection fibres connecting these various areas with lower parts of the central nervous system are medullated at different periods and in the discovery of the existence and topographical distribution of the secondary centers of a higher and fundamentally different significance—the so-called association centers of the cerebral cortex.

Through improvements in the compound microscope, especially by devices for increasing the illumination and for the elimination in large part of the spherical and chromatic aberration, it has been possible to obtain a clear definition of microscopic objects, even when magnified 1,000 or 2,000 diameters. The extension of the powers of the human retina thus made possible, together with the advances in staining, clearing and mounting, have revolutionized the science of histology and microscopic anatomy, and the old-time six weeks' course given in these subjects has been replaced by one of as many months. Cytology in general has made enormous strides, and with it cytology in particular, although curiously enough the nervous system, owing to the peculiar character of its cellular elements, did not reap the benefits quite so soon as did

the other organs of the body. But when once results began to be attained in the nervous system by these methods or by particular modifications of them suited to the special structure of the nervous organs, they came with a rush, and during the past two decades the world has been flooded with books and original articles in morphological journals dealing with the results of research into the histology and architecture of the nervous system. To Golgi, of Padua, belongs the credit of devising a form of metallic impregnation which better than any other procedure outlines the external form of the nerve cell and its processes, especially in embryonic tissues. Utilized by many students in many countries, this method has taught us how complicated the various processes of the nerve cell really are; it has shown us the external morphological differences between dendrites and axones, the varying appearance of these structures in the same part and in different parts of the central nervous system, and has given us an insight into the various inter-relations which exist among the cellular units of which the system is made up. Very recently, by slight modifications of the method, Golgi has shown that it can be utilized to demonstrate not only the reticular investment of the perikaryon and dendrite, but also certain curious network-like appearances inside the nerve cell protoplasm. The objection, therefore, that Golgi's method affords no information with regard to the interior of the neurones can no longer with justice be urged.

The method of vital staining with methylene blue or thionin, invented by Ehrlich, not only confirmed in large part the findings arrived at with Golgi's method, but also extended them. A special advantage of Ehrlich's vital staining lies in the fact that with it the axones of medullated fibres can be stained; whereas, with Golgi's method the impregnation of an axone usually ceases as soon as the myelin sheath is reached. By means of the method of fixation which we owe to Bethe, the transitory pictures obtainable by the vital staining may be caught at the acme of development and rendered permanent.

Among the host of cytological methods which are suitable for the investigation of the interior of the nerve cell that introduced by Nissl has been extensively followed up. It consists of alcohol fixation, sectioning without embedding, staining with the methylene blue and soap mixture, differentiating with aniline oil and alcohol and mounting in benzine colophonium. It is especially valuable for the examination of the neurones under normal and pathological conditions with respect to the amount of the stainable substance of Nissl present in them

and its distribution in the cytoplasm. Other similar methods, such as thionin staining, toluidin blue staining or double staining with methylene blue and erythrosin, offer special advantages for certain purposes.

To demonstrate the neurosomes, fixation in a neutral solution and staining with iron haematoxylin (Held) serves admirably. Fibrillary appearances are discoverable in tissues fixed in chrom-osmo-acetic acid and stained in saffranin (Fleming). They are exquisitely stainable in invertebrate tissues by a sublimate gold method and by a haematëin stain (Apáthy); while in vertebrate tissues they are most easily demonstrable in cells which have been treated first with ammonia, afterwards with hydrochloric acid, then with molybdic acid and finally with toluidin blue (Bethe). The action of alkalies, acids and digestive agents of various kinds should also be mentioned.

Concerning the synthetic methods there is but little to say, inasmuch as the sole procedure which has been employed by the majority of neurological investigators is the mental fusion of the pictures obtained by isolation and sectioning into more or less vague ideas of solidity. Actual reconstruction in tangible form of the solid bodies in the nerve tissues from a faultless series of sections has been carried out only by a limited number of workers.

This method originated with the embryologists and grew out of the desire felt by investigators to reproduce exactly in three dimensions the magnified details of external and internal form as studied in microscopic sections. If an embryo be cut into serial sections, and section after section be studied, the exact relations in the individual sections can be easily made out. But even anatomists endowed most liberally with what may be termed the spatial sense find difficulty in uniting a long series of sections through several bodies as seen through the microscope into an integrated, accurate conception of the solid bodies thus magnified. My experience teaches me that a relatively large number of students are almost absolutely devoid of this power of integration, or as it is sometimes expressed, of thinking in three dimensions when studying a series of sections. For the purpose of coming to more accurate conclusions himself, and especially with the object of making certain form conceptions clear to students, Wilhelm His, of Leipzig, many years ago introduced his method of graphic reconstruction from serial sections. His procedure is so generally known that I need not take the time to describe it in full. He used, it will be recalled, paper ruled at distances cor-

responding to the thickness of the sections multiplied by the magnification employed. The outline drawing of the whole object over these lines thus permitted the introduction on the parallel lines of the paper the limits of any desired object in the various sections. In this way extremely valuable flat projections of the various internal organs and tissues could be obtained, and the method is a favorite one at present with many embryologists.

From a series of projections of the organs as viewed from different aspects it is possible for an artist to model them in clay or wax. Thus there arose through the combined activities of His and Ziegler the exquisite models illustrating various stages of development of the embryo chick which are nowadays a feature of so many anatomical museums.

Not all investigators, however, are gifted with the mathematical knowledge and artistic talent necessary for the successful application of the method. Somewhat later reconstruction with the help of wax plates, permitting the making of wax models directly, from the specimens, was introduced by Born. In the 22 years which have elapsed since he first employed the method many improvements have been made, so that a number of technical difficulties with which he had to contend can be avoided. It is this method of reconstruction modified and improved which Dr. Mall has used so successfully in the study of the anatomy of his series of human embryos. It is also this method which Miss Sabin, with the aid and counsel of Dr. Mall, has employed in the construction of the model of the medulla oblongata, pons and mid-brain which I here show you.

The prerequisites to the work are (1) the possession of faultless serial sections of the objects to be studied stained in a suitable manner; (2) an intelligent idea of the general relations and significance of the contents of the sections as seen through the microscope; (3) suitable mechanism for the production on paper or directly on the wax plates of the magnified picture of the section (camera lucida or Zeiss projection apparatus); (4) wax plates of proper dimensions and consistence; (5) the guidance of an experienced workman; (6) patience, industry, enthusiasm and a certain amount of spatial sense and mechanical skill.

We are fortunate enough to possess in the anatomical laboratory at Baltimore several sets of serial sections cut in various directions through the brain stem and cerebral hemispheres of human *fœtuses* and babies of different ages illustrating accordingly different stages of development.

The early form relations of the human nervous system have been worked out by His, and his results are embodied in his well known series of models. Last year Mann, of Edinburgh, presented at the anatomical society reconstructions of single nerve cells. Thus far, however, no one, to my knowledge, has published the results of reconstruction of the medullated tracts in the human nervous system. It has occurred to us that the analysis of tracts rendered possible by the embryological method of Flechsig offers a most suitable field for the application of the reconstruction method. A number of students may, we believe, conduct such investigation satisfactorily, and without interference with their regular medical studies. The task of making such reconstructions was accordingly assigned and a number of models are now in progress. The first fruits of the work are represented by this model upon which Miss Sabin has been engaged in the time she could spare from her regular studies since one year ago last March.

The portion of the brain represented by the model is that of a human foetus near full term. It was cut into horizontal serial sections and stained by the method of Weigert-Pal by Dr. John Hewetson in the anatomical laboratory of the University of Leipzig. Circumstances preventing Dr. Hewetson from continuing his work with the specimens, he was kind enough to place them at the disposal of instructors and students at Baltimore.

After some preliminary study of a series of transverse sections through the medulla, Miss Sabin made a more careful study of the series of horizontal sections until she was sufficiently well oriented with regard to the principal medullated tracts and grey masses to proceed with the actual work on the model. Every other section, by means of the Zeiss apparatus and electric illumination, was projected, magnified $14\frac{1}{2}$ diameters in a dark room upon a sheet of white paper, and the outlines of the tracts and nuclei were drawn in accurately with lead pencil. This outline drawing was subsequently made entirely accurate with regard to certain details by control studies with higher powers of the microscope. After all the drawings had been made and corrected each one was accurately transferred by means of carbon paper to wax plates, numbered to correspond, each wax plate, of course, representing in thickness 29 times the thickness of the individual sections. To facilitate subsequent manipulations the areas on the wax plates were painted in various colors.

The wax plate sections once completed, it was necessary to cut out the various areas and to begin piling the sections of the

different tracts and nuclei upon one another so as to reproduce the exact form magnified $14\frac{1}{2}$ times in the three dimensions. Here the investigator meets with his greatest difficulty, and it is just at this juncture that natural mechanical skill, as well as experience, count for much. In order to pile the pieces correctly the worker is helped enormously by (1) a knowledge of the external form of the whole object before it was cut into serial sections, and (2) a knowledge of one or more localizable perpendiculars or curves which can be used as a guide. There need be no trouble about the external form if an accurate drawing from three aspects or photographs of the object have been made to scale before the sections are cut. Unfortunately in the present instance no such drawing or photograph was obtained, and Miss Sabin had to resort to a method discovered independently by Selenka and Mall, which obviates the difficulty. Several brain stems of fetuses of the same age were studied in the gross with particular reference to the external form. The drawings of the sections were then cut out (whole) of the wax plates and piled repeatedly until the type form as learned from the study of other specimens was approximated as nearly as possible. Then the waste of the wax plates, that is, the boundaries of the holes after the drawings of the sections were cut out, were piled up in an exactly similar manner. A cast of the holes was then made with plaster of paris, the wax picked off, and the external form permanently preserved as a guide.

As to the establishment of perpendiculars and curves, the middle line of the sections of the symmetrical nervous system serves admirably in the one dimension; for the other two dimensions the curves of the external form were followed, helped out of course by the known distances of the individual structures from one another in the different sections. The stratum interolivare lemnisci and lemniscus medialis were first modelled and the other structures built up about these.

The various ingenious contrivances which had to be invented to work out successfully many of the details of the structure may be passed over at this time without mention. They will doubtless be described by Miss Sabin in full in her publication. After the various parts had been reconstructed and the edges smoothed with a hot iron the medullated bands of fibres were painted white, the motor nuclei blue, the nuclei terminales of the sensory nerves red, and other grey masses yellow.

At first glance the gross relations represented by the model are clear—the upper extremity of the spinal cord, the medulla oblongata, the pons and the mid-brain. The remarkable curves

made by the central cavity (1) at the junction of the central canal of the cord with the fourth ventricle and (2) in the region of the aqueductus cerebri are illustrated. The medullated tracts of the cord can be followed upward into the rhombencephalon. The division of the nervus acusticus into its two components, and their relations to the corpus restiforme, and their nuclei terminales are observable. It is seen that the nucleus nervi cochleae ventralis forms a continuous mass with the nucleus nervi cochleae dorsalis lying lateral from the corpus restiforme. The situation of the striae medullares is indicated. At the isthmus the nervus trochlearis of one side undergoes decussation with its fellow of the opposite side.

On removal of the nervus acusticus and the corpus restiforme, the course of the ascending and descending limbs of bifurcation of the fibres of the nervus vestibuli can be studied as well as the relations of these to the various terminal vestibular nuclei—the medial, the superior, the lateral nucleus, and that of the descending root.

The modelling of the nervus trigeminus with its motor nuclei of origin and sensory nuclei of termination has been particularly instructive. The course of the tractus spinalis nervi trigemini, the division into a larger lateral and a smaller medial portion, the relations of these bundles to the substantia gelatinosa, the descending mesencephalic root, the minor motor nuclei and the principal motor nucleus and the relations of the motor nuclei to the portio minor of the peripheral nerve—all are evident. The fibres of the nervus glossopharyngeus and of the nervus vagus now come into view, and it is seen how large a mass of the glossopharyngeal fibres go to form the tractus solitarius. The relations of the motor fibres to the nucleus ambiguus and of the sensory fibres to the nucleus alae cinereae are demonstrated.

These two large masses of grey matter painted yellow, fitting so accurately into these irregular cavities in the white matter which represents the medullary continuation of the dorsal funiculi of the spinal cord, are the nucleus funiculi gracilis and the nucleus funiculi cuneati respectively. The difference in the distribution of internal arcuate fibres derived from the two nuclei is obvious.

Removing the last mentioned structures the funiculus lateralis, and the bundle of fibres going into it from Deiters' nucleus can be better examined. The motor nuclei of the medulla are now well exposed, and the division into a lateral group and a medial group is seen. The nucleus ambiguus and

the nucleus nervi facialis are evidently members of the lateral group, while this long curved nucleus nervi hypoglossi and the nearly spherical nucleus nervi abducentis are more medially placed. The old bugbear of the raw student in neurology—the course of the nervus facialis inside the medulla—has lost its terrors, for here pars prima, genu, and pars secunda are all seen at once, the excursion around the sixth nucleus is evident, and the final plunge through the corpus trapezoideum to the outside can be readily followed. Higher up the motor nuclei of the nervus trigeminus, the nervus trochlearis, and the nervus oculomotorius are seen. The inclined plane formed by these upper eye muscle nuclei is rarely understood from the study of transverse sections alone, although in sagittal sections of course the inclination is obvious.

Let me call your attention to the plastic representation of the lateral lemniscus and the medial lemniscus. The relations of the lateral lemniscus to the corpus trapezoideum, to the superior olivary complex, and to this long drawn out nucleus lemnisci lateralis which lies in a trench on its lateral surface, as well as the intimate connection of a large part of the bundle with the colliculus inferior of the lamina quadrigemina, are prominent features of the model. No less instructive is the illustration of the origin, course and distribution of the fibres of the medial lemniscus or fillet. Starting below as a vertical mass of fibres—the stratum interolivare lemnisci—formed in large part of internal arcuate fibres which have crossed the raphe from the opposite side of the medulla, it is continuous dorsally in the first part of its course with the fasciculus longitudinalis medialis or so-called posterior longitudinal bundle. Higher up the two bundles are separated by masses of grey matter and from the corpus trapezoideum on, the medial lemniscus, now much increased in volume, alters its position and direction, spreading out as you see into this large curved fan-shaped mass.

Miss Sabin's model of the brachium conjunctivum supports very conclusively the view that the ventral part of the decussation of the brachia of the two sides represents a vestibular commissure. The pocket between the ventral and dorsal portions of the decussations is here visible, and is very satisfactory to note that the portion of the brachium conjunctivum on each side corresponding to the ventral decussation is related directly with the antero ventral extremity of the nucleus nervi vestibuli superior or Bechterew's nucleus. The results which concern the fasciculus longitudinalis medialis, the formatio reticularis alba et grisea, the decussationes tegmento-

orum, the nucleus ruber and the bundles of white fibres near it, the fasciculus retroflexus of Meynert, and the substantia nigra are of interest, but to fully appreciate them or indeed any part of the model it is necessary to study the serial sections along with the reconstructed parts. It is in this way alone that the value of blending the areas met with in the individual sections into the solid wax bodies can be fully appreciated, and a real mental coalition effected.

One can hardly fail, I think, to be interested in the appearance of the nucleus olivaris inferior, here for the first time, I believe, accurately reproduced in three dimensions. To me it is one of the most instructive parts of Miss Sabin's work. Every one who has studied the olive in sections knows that the grey matter is repeatedly depressed and elevated on the surface, and each of us probably has formed some vague idea of the wrinkled shell corresponding to the whole structure. But who would have guessed that the olive presents the remarkable appearance we see here! It is obvious on examination that the lateral surface is divided by deep fissures into lobes, and that each of these lobes is further subdivided by shallower sulci into gyri. That these sulci and gyri are no accident, but tolerably constant features, is clear from the reconstructed olive of the opposite side, which is almost the exact counterpart of its fellow. Since the gyri and sulci are as definite and characteristic as those of the cerebral cortex, Miss Sabin will, I have no doubt, name them for convenience of description. If the medical student of the future had to learn by rote the new lists of names which such studies are constantly thrusting upon us, he would indeed need to be commiserated, but fortunately instructors and examiners are becoming more sensible than their predecessors in what they demand of their students.

This method of wax reconstruction, then, represents the most accurate of the integrative methods at present at our command. In the solution of morphological problems connected with organs the most complex in architectural arrangement in existence on this planet it is capable, I believe, of wide application. That it will, sooner or later, have served its purpose and be replaced by more delicate and accurate integrative methods yet to be discovered, there can be but little doubt, for while on the one hand those who are familiar only with the mental arithmetic reconstruction in general employed, are much impressed when they first become acquainted with the wax plate method, with the beauty and accuracy of the spatial concepts attainable through it; on the other hand, those who know it best and are

familiar with the history of technical procedures in the past, are conscious of its crudeness and aware of its limitations, and they are prepared for, and will welcome the time when we shall be presented with three dimension reproductions of the nervous organs as much superior to these wax plate models as the latter are to the less accurate, but at the time of their production extremely valuable schematic models of an Aeby or a Cazeaux.

Before closing this lecture, which I fear has already made too great claims upon the graciousness and patience of some of you, I must beg your indulgence still further for a moment in order to refer briefly to the importance of more systematic neurological instruction in our medical schools, the value of combining such instruction with neurological investigation, the necessity, in order to accomplish this end, of the development of better teachers and more perfect laboratories and laboratory organization, and finally of the benefits derivable from a better understanding of one another's aims among laboratory investigators and clinicians, and from such co-operation among these as may, while in no wise interfering with individual liberty, permit of the direction of their specialized activities along the lines of a more or less co-ordinated plan.

It has for several years past seemed to me a striking anomaly that so little provision has been made, even in medical schools generally recognized for their excellences, for the study of the structure and function of the human and animal nervous system, especially since everyone prepared to think accurately and who has given the subject thought, readily admits that it is precisely by virtue of his neural pre-eminence, rather than by marked special advantages in other parts of his body, that man ranks first among the animals. The difference, too, between individual men lies in large part in differences in nervous organization, and, indeed, it is owing largely to our knowledge of differences in brain morphology and brain capacity that we can, without fear of successful contradiction, designate the statement, "All men are born free and equal," one of the greatest fallacies which has ever moved large bodies of men into action. When we remember this and recall the large proportion of ailments which have a neural or psychic element in them, is it not surprising, to use as mild a word as I dare, that a more or less extended knowledge of the anatomy and physiology of the nervous system has not been regarded as of essential importance in the training of the medical man? It is not long since when even distinguished professors of medicine in our best medical colleges were brave enough to admit—indeed, seemed delighted to

jocularly confess—that they “never could understand the fillet.” But while at that time knowledge was so limited and the means of acquiring the little possessed were so inadequate that such a confession was one of which he who made it need not necessarily be ashamed, that period is now happily past and we have entered on an era in which neurological facts tolerably accessible and of extreme practical usefulness are by no means few in number. It is owing to our ignorance of the anatomy and physiology and pathology of the nervous system that we are unable as yet to manage as successfully as we would that host of so-called functional nervous disorders which unhappily are becoming so prevalent among us, and it is in large part due to this ignorance that the flora of “the Garden of Cagliostro” is so rank and luxuriant. Not until medical men understand psychology and learn how to recognize and cope with the psychic factors of disease and ignorance need we hope to prevent the access to “Gloria mundi” of some disciple of the Prince of Quacks.

A study of the early records which have come down to us teaches us that in ancient times the healing of the body was entrusted to the priests, who thus ministered to the physical as well as to the spiritual needs of their people. Since then the science and art of medicine have become separated from the priesthood. But is it impossible that at some time in the not very distant future, when through the fusion of converging lines of research psychology has come to be recognized in its normal relations as a department of physiology, psychiatry as a department of pathology, a re-distribution of labor should take place and the functions of physician of the body and physician of the soul come again to be united in a single individual?

Two great difficulties at present obstruct progress. (1) The lack of trained individuals to serve as teachers and to conduct research, and (2) notwithstanding the remarkable multiplication of so-called laboratories, the lack of appreciation of the importance of suitable laboratory organization. Any one living in one of the large centres of medical education, in touch with the leaders of medical thought in such places and conversant with the extraordinary demand for trained men to undertake responsible laboratory and clinical positions, when he sees the difficulty of filling such positions, cannot fail to lament the gross errors of the system of education responsible for this condition. In a country full of young men with great natural aptitude and unprecedented adaptability, it is a pity to

have to confess a dearth of men with real skill. This is not the fault of the men, but the lack of opportunity for adequate training. A wave of educational reform in medicine and in the natural sciences is sweeping over this country at present. The faults of the older régime are being recognized and the prospect for the future, I am glad to say, is bright.

Medical faculties have been too prone to imagine that the construction of large lecture halls and magnificent laboratory buildings will suffice for the development of a productive department and the institution of adequate instruction, but too often they are disappointed in the results. A shrewder foresight and a wider wisdom puts its money into *men*, the other necessities follow of their own accord.

That much of the best talent and capable brain is diverted from scientific channels in a country where for comfortable existence considerable sums of money are necessary, is easily understandable when one remembers how meagre the pittance so often accorded to the holder of a scientific chair and how much greater the same talent and the same brain capacity can command in a different market.

But given a good laboratory and given a good man, the conditions for successful instruction and investigation are by no means fully satisfied. An institution nowadays can no longer hope to succeed by taking a scientist into a brick box and saying to him, "Robinson Crusoe, here is your island." The director of the laboratory must be accompanied by trained assistants, and it is desirable that these assistants, though, perhaps on the whole, equally expert, be skilled in somewhat different branches of the same department of knowledge. There must be in addition to these assistants provision for the execution of purely mechanical labor, for in shame be it spoken, fine minds before now have been ruined and fair bodies wrecked by being subjected to the iniquitous necessity of menial services which could just as well have been performed by minds and bodies of a much lower order.

Apparatus of various sorts, books and journals, collections of old material, access to new material, all come into the scheme. The division of labor is to be planned; criminal stunting of an assistant's growth by over-demands on his time or in routine work is to be avoided; instruction in the known and investigation of the unknown, but knowable, have to be arranged for. With successful organization, instruction and investigation go hand in hand, and students of the better sort, while acquiring existing knowledge, can add a necessary prop here or a new

beam there to the general mass of knowledge. There is no stimulus so great or so beneficial to good students as the feeling that by accurate, conscientious work they can contribute something, be it ever so little, to the world's store of facts. The time of medical students is usually so limited that only a few can possibly undertake long and complicated researches, but in a large laboratory, with the sort of organization I have in mind, a number of students working on a number of different points in one problem, each contributing his mite, can together collect a mass of data which, when integrated, make a contribution of no mean significance.

The anatomist, physiologist, or pathologist who directs his attention to the special study of neurological problems should, of course, have a solid foundation in general pathology and clinical medicine before giving himself over to such special studies. He should in connection with his work see autopsies, and, if possible, a certain number of patients, and should be in a position to consult with special workers in pathology and internal medicine, helping them, and in turn being helped by them. For in the study of the functions of the nervous system especially no stable conclusions have been or ever can be arrived at with regard to the higher groups of neurones, at least, without the rigid control of clinical and pathological observations on man. Morphologists working alone tend to become one-sided; isolated physiologists cannot fail to focus falsely, and the pathologist and the clinician, if out of touch with one another and with the students of normal structure and function, are bound to arrive at conclusions which are erroneous.

Let each one work by his own methods and push them as far as he can, but let each have reverence for and keep conversant with the work and results of others. We shall then have more facts and fewer hypotheses. Mindful of the fate of our speculative predecessors and in awe of the judgment of some scientific Dungara, we shall do best to make our sacrifices to the God of Things As They Are, rather than pay homage to the God of Things as They Should Be. In this way our building of knowledge will be slow, but what is lost in rapidity will be more than compensated for in solidity.

I have now done. From what I have said it will be clear to you that our knowledge of neurology, so slow in acquisition, is dependent upon the application of a large number of different methods of investigation differentiative and integrative. For the proper understanding of form relations the analyses require to be synthesized in particular and in general. Owing to the

special difficulties in solving problems in the nervous system and the increasing complexity of knowledge of structure and function and methods of investigation, co-operative activity is essential for progress. Such co-ordinated divided labor can be most satisfactorily performed in a series of well organized laboratories in association with medical schools, hospitals and asylums, and in connection with skilled clinical observers. The further pursuit of anatomical, physiological, chemical, pathological and clinical studies will permit of the recognition of ever increasing interrelations among the results with corresponding reciprocal benefit.

THE DETECTION OF FOREIGN BODIES WITHIN THE EYEBALL, WITH RELATION OF TWO RARE CASES.

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When a penetrating wound of the eye has been made by a foreign body the all-important question to decide, after having inspected the nature of the wound, is whether the body which inflicted the trauma is either in whole or in part in the interior of the eye. The wound has been made and is therefore past history. The future of the eye, however, depends very largely on whether the foreign matter is present within, and if so, whether it can be removed. One must face the facts of experience which teach us in no uncertain language that an eye is never safe even when it contains an encysted and immovable foreign body. It should be a rule that if an eye is injured by a penetrating wound and has frequent attacks of redness and pain, and if, as is usually the case, it has but little sight or none at all, it should be removed even when it does not contain a foreign body. If it contains a foreign body, the removal is absolutely imperative under the above conditions, for in either case it will almost inevitably produce sympathetic inflammation in the healthy eye and destroy that and also itself. Hence the physician in charge of such cases rarely thinks of the wound except to see its direction and whether it involves the lens or ciliary body, and to provide against prolapse or bruising of the iris, before he anxiously inquires what sort of a body made the wound, and on learning this he immediately looks to see if it could have entered the eye through the wound, and strains every nerve to arrive at a speedy conclusion as to its presence within the ball, for if he would treat his case rightly he knows that very much depends in such cases on his first move.

Supposing, then, that it has been ascertained that a foreign body lies in all probability within the ball, the more quickly we can determine its exact location the better. In fact in fresh wounds we should rarely allow the patient to go from our presence without having come to a definite opinion on these points. So much depends upon seeing the case early after the injury

that perhaps it would be well to consider the detection of the foreign body, first in cases where the person is seen before the wound has closed, and secondly in those after healing has taken place.

Under division one we will divide the cases into:

First, those where the wound involves the lens, iris, ciliary body, or all three, but does not penetrate the vitreous chamber.

Second, the same where it does penetrate into the vitreous chamber.

Third, those where the vitreous chamber only has been penetrated without injury of the previous tissues mentioned.

Fourth, wounds which are made by large and those made by small bodies.

Fifth, when the foreign body is either of steel or iron.

Sixth, where it is of some other material than that in number five.

It is taken for granted in considering these various points that the conclusion has been reached by questioning the patient that a body sufficiently small to be contained in the limits of the eyeball has made the wound which penetrated it, and that we are aiming to detect its presence and locate it.

The first method at our command as we take up subdivision No. I is inspection, which by direct illumination in fresh wounds, when cleared of any débris, as from explosions, is usually sufficient to discover any foreign body within the limits of the wound proper, or in the anterior surface of the lens or iris. Especially is this true if we add to our illuminating power a focus of light from a lens so placed as to obliquely illuminate the anterior chamber. The first difficulty which lies in the way, aside from the dirt which may have gotten into the wound, is the entrance of blood into the anterior chamber, which latter may entirely conceal from us the anterior surface of the lens and iris. This, however, only takes place where the ciliary body or iris are wounded, rarely in direct injury to the cornea. If simple inspection by direct or oblique illumination leaves us in doubt, one is justified with great care in entering such a wound with a sterilized probe or foreign-body probe (Knapp) with the end in view of, first, seeing that no bit of foreign matter remains between the lips, and secondly, of probing into the depths of the eye in the track of the foreign body, especially where it is quite positive that the wound does not lead into the vitreous chamber. If there is any reason to believe that the foreign body may be iron or steel, the magnet should always be used, as powerful as we can command, to see if it is possible to

drag the fragments from their attachment. One should bear in mind that any such invasion of the anterior chamber is attended with the risk of wounding the anterior capsule of the lens, and even so slight a scratch may prove sufficient to bring on a traumatic cataract. Consequently this method of searching by a probe is limited in its usefulness, and is rarely undertaken except in cases where so great destruction of the tissue has taken place that the probabilities of good vision are very small indeed. Hence it will be seen that our methods of detecting the foreign body in the anterior part of the lens, iris, and anterior chamber, are chiefly those of good vision on the part of the physician in charge, and good illumination.

Where we have a wound extending into the ciliary body or lens, we have to decide whether the foreign body may not, as is frequently the case, have become arrested in the substance of the lens itself, and then we can bring into requisition the third way of detecting the foreign body, namely, that of the ophthalmoscope, together with an oblique illumination in a dark room. If there is not much blood in the anterior chamber one can usually with the ophthalmoscope, either by the direct or indirect method, discover the track of the foreign body leading into the lens, and frequently the foreign body itself at the end of this track. Often the oblique illumination shows this very much better. Except in very rare cases, one is always justified, in order to settle the question, in dilating the pupil widely for the time being, in order to facilitate the examination into the deeper parts. Of course it will be immediately apparent that where the rupture of the iris has taken place, or a tearing of it away from its attachment for any extent, as in the case of a severe blow from a larger foreign body, we may have difficulty in causing the pupil to enlarge sufficiently to see well inside.

Methods one, two and three will usually have discovered that the foreign body, if not in the regions named, has a distinct track leading through the lens, or iris, or ciliary body, into the chamber beyond, and sometimes it is possible to see the rent in the posterior capsule of the lens which is made by the foreign body as it passed through the lens proper, which would thus bring us to the consideration of cases in subdivision two, namely, where the foreign body has passed through the anterior structures of the eye and is in the vitreous chamber. Much depends upon the force with which the body entered the latter part of the eye, for it can do one of three things. It can go with sufficient force to land into the posterior wall of the eye and immediately lodge there permanently, or it can strike

the wall and bound off, or otherwise drop down across a portion of the retina and lie in the bottom of the chamber, or it may just go through the lens with force enough not to traverse the entire cavity, but lie loosely within the vitreous, either in suspension or down at its bottom against the floor.

When the wound is to one side of the center of the cornea, and center of the lens, and even when not, if seen early enough before exudation has taken place, the ophthalmoscope by the direct, or indirect, method will be sufficient to discover to the observer the foreign body lodged in some portion of the posterior curvature of the eye. Supposing, however, the foreign body to have penetrated the vitreous chamber on such a slant, or by dropping down into the bottom of the chamber, to lie very close to the lens, then it may be absolutely impossible to so slant the light that it will illuminate the intruder in its hiding place. If the body be movable it is a question whether it might not be advisable to try by changing the position of the patient's head to throw the foreign body sufficiently far back to bring it into the line of vision. However, the doubt as to the advisability lies in the fact that the retina is probably the most delicate structure in the body, and it cannot bear the slightest touch without permanent injury. Hence we often discover that the furrow down across the back of the eye due to nothing more or less than the rolling down of the foreign body as it drops from a higher to a lower level.

A recent case, which will be detailed later, discovered to me a fact which I had not known before, that where the foreign body was of steel or iron, and movable, the detection of its presence could be made in just that class of cases where we had been utterly at a loss to discover the foreign matter, namely, those where it was situated too close to the posterior portion of the lens. The magnet will act upon iron through a moist tissue of the body, and, as has been proven by the Haab instrument, will, if sufficient power is brought into execution, draw the body directly through the tissues to the magnet. Now the same principle can be applied with less force to lift the foreign body from the darker, deeper recesses of the vitreous chamber into those where the illumination is sufficiently clear for observation, or into those parts which can be reached by direct rays of light. Consequently in the case to be related I was able by applying the ordinary magnet against the front of the eye, the patient being in the dark room, to lift the bit of iron from way out of sight, and bring it up against the posterior capsule of the lens and estimate its size and shape and

other peculiarities during the brief time it was possible to keep the magnet in operation. Thus it was possible to detect the foreign body which would otherwise have been so small as to escape attention, and so far out of range as to be invisible. If the foreign body which has penetrated is not of iron, or steel, and lies in the vitreous chamber where it cannot be seen, we can only conjecture its presence by knowing that a wound has been made by some substance which could not again have dropped out. Sometimes we are able by subsequent history to learn as to whereabouts of the offending body.

To illustrate this point I might mention a case where an eye had been wounded supposedly by a portion of a tack flying up and penetrating the cornea and pupillary margin of the iris, and extending entirely through the lens. No method that I could employ could discover whether the foreign body had actually lodged itself in the vitreous chamber. Too much exudation and too much hemorrhage existed for clear vision and the magnet gave no help. The finding of the tack, complete, showed that the wound must have been made by the point of the tack penetrating into the eye and then falling out again without the patient's cognizance of the latter act. As later the traumatic cataract absorbed entirely away I have been able to illuminate the vitreous chamber sufficiently to substantiate this conception. With glass his vision is normal.

Occasionally when our doubt is extreme, and more especially in late cases, the X-ray presents a method of making a diagnosis which is most happy in its results. However, it has its limitations, and can only be used to advantage when the eyeball lies in a shallow socket. And even here one rarely gets a good negative to show what might lie in the nasal half of vitreous chamber. In one of my cases it failed completely. It will show very nicely a foreign body in a hazy lens.

Where the foreign body is large, as in the case of the specimen which I shall pass around, the destruction of tissue as it entered the eye and penetrated into the vitreous chamber was such that one was certain no vision could ever be counted upon the patient. Hence it was proper to try and remove the foreign body directly through the wound, and as illustrative of the power of the ordinary magnet, we were able to draw the piece of metal directly out through its original wound. And we are also justified if the foreign body is not of iron or steel in these cases to go in first with the probe to discover its location and then remove it with forceps. Such eyes, however, are as a rule better removed than to be allowed to stay in situ, whether

we are successful in removing the foreign body or not. If the wound is such that we may not probe, and the foreign body is such that the magnet does not assist us, we often are compelled to admit that we do not know, as in the case instanced by the tack, whether the foreign body exists in the interior of the eye or not, in which case we have to treat the eye on strict antiseptic principles, cleanse the wound, amputate or replace the prolapsed iris as the case may be. Atropine or eserine should be used to keep latter away from the wound so as to avoid anterior and posterior synechiæ, and allow the eye to clear up. Warn the patient to be ever watchful, for we may never discover whether the foreign body be or be not present. In any case the consideration of its detection passes over into that class where we see the case after the wound is healed.

Where the wound in the eye lies back of the ciliary body the foreign body enters the vitreous chamber on a slant and does not carry with it much blood, but may, if large and ragged, as it crosses the vitreous, leave a trail of blood, and later show the track of exudation similar to the tail of a comet. Such a track frequently leads to the detection of the foreign body.

As has been stated about the bodies that penetrate from the anterior part of the eye, the foreign body may either lodge in the wall, fall down, or otherwise lie at the bottom of the vitreous chamber, or may enter the eye at such an angle as never to cross the field of illumination. The methods of its detection are the same as were considered with wounds that went through into the anterior part of the eye, only that I consider it perfectly justifiable in cases of steel or iron to boldly insert the sterilized magnetic point in order to drag the foreign body out of the eye. In cases of foreign bodies other than iron or steel, it being remembered that the eye will probably be lost in any case if you do not succeed in removing the foreign body, one is justified in passing a sterilized probe into the interior of the eye in direct line of probable course of the foreign body, search for it carefully but thoroughly, and finding it, insert iris forceps, or other instruments, and remove it, as I have done in a case of a flying bit of stone in a quarryman. Useful vision may not always result, but the patient will retain his eye, a thing for which he never fails to be grateful. Right here I would like to add one little point which influences me very frequently in the treatment of such cases, namely, these patients rarely remember your injunctions, and if the eye heals up and you have not removed the foreign body they rarely come back

for further attention. They frequently disregard your advice absolutely as to the necessity of the removal of the eye to avoid sympathetic affection of the opposite one, and will some day turn up, either in your office, or more probably that of your neighboring oculist, blind or about to be so. This, therefore, without further comment, indicates the responsibility that rests on the shoulders of each and every one of us, and stimulates us to adopt even rather radical measures in order to accomplish the removal.

The prognosis of wounds in the vitreous chamber, where care is taken to avoid infection, is very good, so that one need not hesitate in the least to be thorough in his work of detection.

The fourth class of foreign bodies, as to whether the body was large or small, has been somewhat touched upon. Large bodies produce so much crushing and maceration of the tissues that you are justified in usually being bold as to your methods of detecting, and removing the foreign body, for, in all probability, the eye itself will have to be removed. On the other hand, where your foreign body is small, and where it is liable to become encysted, and where it is not liable to produce trouble from chemical action, there is no doubt that it may not give any trouble and the eye be useful for many years. In fact, I know instances where some other accident has happened to the good eye, and the wounded eye, with its foreign body, served its owner to a good ripe old age. Consequently, where I am sure that the foreign body will, in all probability, remain in its lodging place, I feel that I am not justified in taking too radical measures to remove it, especially if I have an intelligent patient who can be made to comprehend the necessity of carefully watching his eye, and reporting to a competent person in case of trouble with it. A small foreign body can make so small a wound that in forty-eight hours you may be unable to detect the way or the place that it entered the eye, and yet a foreign body cannot be so small but what if it pierces the capsule of the lens there will inevitably result a traumatic cataract, which, time and again, in people who work where eyes are frequently hit by flying bits of metal and other substances, is the first evidence that the eye had really been penetrated.

Divisions five and six have been sufficiently discussed in the remarks which precede. It need only be added that there are substances which make more trouble than others by their chemical make-up, and brass and copper seem to make more trouble in an eye than do bits of steel.

Now, when we are requested to pass opinion upon the existence of a foreign body in an eye which we see after the wound has healed, the same subdivision of the subject might be made as was before, but, for the sake of brevity, we will simply speak of the main difficulties. The first difficulty is that the wound, in the case of a very small foreign body, may be, as has already been stated, invisible at the end of forty-eight hours, and only the formation of changes in the retina, or the vitreous, or the lens, or by the inflammation and constant irritation in the region of the ciliary body, are we made aware of their presence. Haziness of the lens comes on at the end of twenty-four hours where a rent has been made in the anterior capsule, and if the patient delays forty-eight or seventy-two hours, one may be unable to make any decision as to whether the foreign body be in the lens, or have traversed it and be in the vitreous chamber. In such cases, however, if the foreign body is movable, and you have a powerful magnet, you may be able, in the case of iron or steel, to make up your mind as to its presence in the posterior chamber. This is done by bringing the patient very close to a Haab or other powerful magnet, turn on the current, and he may be able to feel the motion of the foreign body in the eye, or the traction which it produces on the eyeball, or the operator may be able to see the bulging of the sclera made by the attempt of the body to reach the source of attraction. Such a diagnosis having been made, the treatment is evident. In the cases where the anterior chamber is filled with blood, and sometimes in the case of the vitreous chamber, the waiting of a week will so clear up the field of vision that the foreign body may be located. Usually only a couple of days is necessary to clear up the anterior chamber sufficiently so that the foreign body, hitherto invisible, may be seen lodged in the substance of the iris, and may be removed by an iridectomy.

Foreign substances, such as powder, may frequently enter the eye, and if the inflammation can be kept down sufficiently during the first few days, will absorb and become innocuous as in the conjunctiva and face. Of course it is then very undesirable to have to wait in the cases of movable foreign bodies, for the effect of the presence of a foreign body in any position in the eye is to create a little irritation, which starts exudation of lymph which surrounds the foreign body and renders it immovable and thus handicaps you in your efforts at its removal. It is obvious that you cannot always make your incision, for example in the vitreous chamber, at a point near the foreign body, hence a few days delay may make all the differ-

ence between removing the body or removing the eye. Frequently, as stated in the beginning of this section, however, we are confronted, as in the case of a patient whose history I shall briefly relate, with the question, shall I or shall I not remove the foreign body? Or to put it another way, will the operation for the removal of the foreign body be more liable to produce blindness in the eye in question, than to allow it to remain? Such a question was propounded to so eminent a man as Dr. Herman Knapp of New York, and he decided, and I think with right, that a formerly movable foreign body having become encysted and stationary, might remain and cause no trouble. As this was a single eye, and as the foreign matter was not iron or steel, the operation for its removal might take away the little vision which he had and it was better that it remained.

We, however, cannot impress too strongly on our patients the fact that we must regard an eye with a foreign body in it with suspicion, and should never fail when such an eye shows the least sign of irritation, the symptoms of which should be plainly detailed, to report immediately to some one in order to avoid the possibilities of sympathetic inflammation.

Case I is of interest, in that it is absolutely typical in its history, illustrates all the methods of diagnosis and detection, and was unique in the method in which the foreign body was discovered.

I was consulted on October 11th by a patient who related that the previous afternoon he had been hammering a piece of iron plate with a steel hammer. During the process of shaping the iron he felt a little something strike him in the eye, but as this had happened a thousand times before, he paid no attention to it. The following morning, when he got up, he discovered that his eye was very watery, and that he could not see clearly. He had had no pain and slept well through the night. I discovered on inspecting his eye that it was suffused, slightly red, and showed in the inner and inferior quadrant of the cornea a very slight scar. Oblique illumination discovered to me the fact that the edge of the iris had also a little nick in it, and that there was apparently leading from the cornea to iris a very slight haziness. More powerful illumination in the dark room after dilating the pupil, which was found to be already adherent to the anterior capsule of the lens, showed a wound of the anterior capsule of the lens, a track leading through the lens, and a rent in the posterior capsule. It was therefore evident that the foreign body was in the vitreous chamber. The ophthalmoscope, however, failed to reveal anything. There was

not the slightest trace of blood, not the slightest wound on the retina, everything was absolutely normal. Except for the watery condition of the eye, vision was almost perfect. Taking my magnet and connecting it with a two-celled storage battery, I brought the point against the anæsthesized cornea, during which time the eye was brilliantly illuminated by an oblique shaft of light. What was my astonishment to see suddenly coming into view, hitting against the posterior capsule of the lens, but the piece of steel which had wrought all the mischief, and it is now reposing quietly in the bottom of this box which I pass around for your inspection. The current was so strong that the button of the magnet became hot and I was obliged to relax the current, and immediately the little particle dropped out of sight. Had I had a more powerful magnet undoubtedly I could have drawn the foreign body out through the old wound, but all that could be accomplished was a most beautiful exhibition of the attractive power of the magnet, for I could not resist the temptation of seeing the little particle fly up against the lens a number of times. The picture reminded me very forcibly of a moth or other insect bumping against a window pane on a very dark night, being only visible when it came into contact with the glass and was illuminated by the light of the room. What to do in this case was very plain. In the afternoon the patient came to the office, and a meridional incision was made at the equator into the sclera between rectus inferior and rectus externus muscles, and an attempt was made to remove the foreign body through the opening. The great trouble in such operations always is to keep the sclera wound open so that the piece of steel when it is attracted to the magnet need not be brushed off and thus again left in the interior of the eye. To hold the incision open with any of the ordinary instruments at command, which are of steel, simply takes away the power of your magnet, and I hit upon a little scheme which in this case served me very nicely, namely, to take the German silver spud which is used in the cataract operations, put it into the incision on the flat, turn it on its side, and the wound was held wide open. Considerable vitreous came out, but I should have been unable in this case to get the foreign body out unless the wound had been wide open. As it was, it was necessary to introduce the point a full quarter of an inch into the vitreous chamber before I succeeded in removing the body. After the removal the conjunctiva was stitched over the sclera wound, the eye was bandaged up, and an uneventful recovery took place. Meantime of course

a traumatic cataract has continued to form, but so far so very slowly that there has been no disturbance to the tension of the eye, and even now the patient can see large objects clearly.

Case II illustrates how foreign bodies like lightning may strike in the same place twice, and it also indicates all of the difficulties in the detection of a foreign body.

On the 15th of October, 1894, a man of 34 years consulted me, stating that two days ago he had felt his eye struck by a foreign body. At that particular time he was busy hammering upon an iron barrel stave with a hammer. His eye watered a little at the time, but soon felt better, and so little inconvenienced was he that he read all the evening, taking particular pains to test the vision of the eye which he had hit and discovering that it was not seriously affected. On the morning of the second day after the accident he awoke with profound haziness in the eye, could not see anything clearly, and the eyeball suffused and red and somewhat painful. He arrived at my office in that condition and the closest inspection of his eyeball failed to reveal anything whatever of an external wound. The iris and lens were perfectly free from any signs of trauma and the lens absolutely clear. The vitreous chamber of the eye was cloudy, filled with blood, and no view of the retina could be obtained. After a few days the eye seemed to clear up a little and a fair view of the papilla was obtained, but nothing could be seen of any foreign body at the time. Following some accident or strain to the patient the eye became worse, and the vitreous became absolutely black, not pervious to a ray of light, and the record of the 4th of February following showed it still to be the same. Sometime within a few days following the accident the patient consulted Dr. Knapp in New York, and he was unable by any means to discover the existence of any foreign body in the eye, although the symptoms pointed that way. I had previously tried a very powerful magnet, but perceived no effect on the patient such as would indicate the presence of a foreign body, and Dr. Knapp did the same. After a year or more, during which time the patient had not been under very close observation, the eye seemed to clear up, and at the present time one can view the entire vitreous chamber. From the scars which exist across the surface of the retina, it would seem to be absolutely certain that a foreign body must have entered the eye and injured the retina, but what and where it is I do not know. Vision is now almost limited to light and shadow. On November 10, 1896, I was consulted by the patient, who stated that eighteen hours before he had engaged in celebrat-

ing the election of President McKinley, and had fired off a cannon by means of a primer. Something had happened to disturb the explosion of the latter, and it had gone off in such a way as to wound the patient's good eye, and he had taken the train for New Haven as soon as he could thereafter. On the way down he was conscious that his vision was gradually growing less and less, and he feared from his former experience that his good eye had been penetrated by a foreign body as had the other. To emphasize the fact there was a wound a little over an eighth of an inch in a vertical direction just posterior to the sclero-corneal junction on the nasal side, evidently leading down into the back of the orbital cavity. This had been bleeding through the eighteen hours which had elapsed since the time of the accident and my seeing the case. During the last few hours the patient's eye had been painful. There was no wound of the cornea, considerable redness and injection of the conjunctiva, and the anterior and vitreous chambers were both clear for inspection. Dilating the pupil showed that in that portion of the vitreous chamber corresponding to the external wound of the conjunctiva there was the extravasation of a large amount of blood between the retina and choroid. There was, however, no free blood in the vitreous. In the region of the macula there was evidence of some retinal disturbance, the nature of which I was not sure, until by the patient turning his eye very far down I could get the outline of a small foreign body lying at the bottom of the chamber very close back of the lens. Examination of the wound in the conjunctiva showed the sclera bare, but I was unable with the finest point which I could command to discover any opening whereby the foreign body could have gotten into the eye. Evidently the body which made the wound in the conjunctiva was very much larger than could have been made by the body which entered the eye. Probing into the external wound I was able to go three-quarters of an inch along the side of the ball and back in among the muscles and nerves without discovering any foreign body to account for such a track. I spent an hour and a quarter in thoroughly investigating this wound and examining the eye, and came to the conclusion that it was absolutely impossible to get the foreign body in the eye out through the old wound, and that there was no foreign body in the wound external to the eye. The patient's eye was treated on general principles, the wound healed up without accident, but it was discovered that the foreign body in the eye was movable, and as the vitreous chamber cleared up more and more, I dis-

covered there was a large separation of the retina, a large scar on the retina in the region of the macula, and the vision was reduced to 36 on the Snellen card. All inflammation subsided in the eye, and finally the foreign body seemed to become attached so that it no longer moved during examination. As soon as it was considered safe to take the patient to New York, Dr. Knapp, as was stated in a previous part of the paper, saw patient and deemed it unwise to make any attempt to remove the foreign body. Later his vision became less, but on the 22d of March was again improved. About this time an X-ray picture was made of the ball, but it was impossible to bring out the foreign body in the negative, nor was anything seen of a foreign body in the neighboring structures of the eye. Following this, but apparently not as a result of it, the patient lost in vision again, and later settled down to his present average, which is by the best illumination 36 Snellen. The subsequent history of the patient was uneventful until the 13th of January, 1898, when he came up to me in great trepidation, saying that the people at home had discovered something down in the corner of the eye directly under the scar of his original wound. I was very much astonished to find as I slit open the conjunctiva the shell of the primer cap, which I pass around for your inspection. A year and two months this foreign body had lain in the tissue of the orbit, and had gradually worked its way from the deeper to the more superficial portions, and had been there without any symptoms of its presence. The foreign body within the eye still remains and has lately become so surrounded by lymph and other exudation that it is now a white knob at the bottom of the vitreous chamber. The patient's general vision has somewhat improved, and the fact that the good eye was injured has not been without effect upon the eye first hurt, for it, too, seems to have picked up a little, but the patient is, notwithstanding, unable to read or write except with a very powerful magnifying lens.

I think this case is absolutely unique, especially as regards the foreign body remaining so long in situ without symptoms.

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THAT Professor Alexander's lecture, in the Alumni course, was all that had been predicted for it, was thoroughly appreciated by those who heard his discussion of "Disease of the Prostate Gland." Rarely have we had the pleasure of listening to a more interesting or instructive lecture on any subject relating to medicine. The Doctor has for the past ten years been making a special study of the prostate, and the clear and concise manner in which the results of his work were put forth impressed one that the speaker was master of his subject. In order that all might understand and follow the discussion, lantern slides, excellent both in character and distinctness, were exhibited and carefully explained. The normal gland, for, says Dr. Alexander, it is primarily and essentially a gland, was first described, its gross appearance, lobes and commissures, and its histological structure. The various forms of hypertrophy, one affecting the lateral, another the so-called middle lobe, etc., were then demonstrated, and photographs of the gross and microscopic sections, illustrating the various conditions, were thrown upon the screen. Accessory prostate glands, situated about the bladder and urethra, were shown, together with their significance when

diseased. The relation of the gland to the bladder and urethra and the influence of its hypertrophy upon the power of completely emptying the bladder were thoroughly discussed. In his researches, Dr. Alexander has collected a large amount of clinical material, and the results, when published, will place our knowledge of this gland, both anatomically and clinically, upon a much firmer basis.

We are unable at present to announce the subject for the next lecture in this course, which will occur sometime during the latter part of the winter. But we would urge a larger attendance at these lectures than in the past, for they afford an opportunity not to be neglected and should demand the support of all.

MEDICAL SOCIETY REPORTS.

NEW HAVEN MEDICAL ASSOCIATION.—The Annual Meeting of the New Haven Medical Association was held on Wednesday evening, January 4, at the society's rooms on Chapel street. The meeting was exceptionally well attended, about fifty-five members being present. The meeting was called to order at 8.45 p. m., and in the absence of the President and both Vice-Presidents, Dr. Beckwith was elected chairman.

The report of the Prudential Committee was read and accepted. This report contained the following resolutions: (1) That the annual dues for 1899 be five dollars. (2) That the monthly collations be omitted during the coming year, and that an annual banquet be given by the association at the time of the next meeting.

The report of the Finance Committee was read and accepted. This showed funds in the hands of the Committee amounting to \$3,236.57, an increase during the past year of \$204.75. The reports of the Secretary and Treasurer were read and accepted. A list of members three or more years in arrears for dues was read by the Secretary. After discussion, it was voted that this matter be laid on the table.

It was voted that the Treasurer be instructed to pay to the Library Committee \$150 from the treasury.

Officers for the ensuing year were elected as follows: President, F. W. Wright; First Vice-President, A. N. Alling; Second Vice-President, N. R. Hotchkiss; Secretary and Treasurer, R. A. McDonnell; Prudential Committee, H. L. Swain, F. H. Whittemore; Finance Committee, H. Fleischner, G. Eliot. The Com-

mittee on Revision of the Constitution, in Article III of the Constitution, reported in favor of a modification which would make the Prudential Committee consist of the President, Secretary and one other member who should be elected annually. The majority of the Committee reported in favor of abolishing the office of Second Vice-President. This whole Committee report was laid on the table.

The report of the Library Committee was read and approved.

It was voted that the Prudential Committee prepare an annual banquet in about two weeks. The meeting then adjourned.

MEDICAL PROGRESS.

THE ACTUAL AND THEORETICAL FACTS OF IMMUNITY.—(*Deutsche Med. Woch.*, No. 42.) Behring maintains that the true significance of the word immunity has not yet been thoroughly established. Frequently immunity is regional in character, that is to say, an animal is immune to a poison introduced through the stomach or subcutaneous tissues, though it may readily succumb to the disease when the poison is inoculated into the brain. Still it is proper to say that an animal is immune when it is protected against the action of such a dose of poison as is destructive for other animals under a like mode of application. The reason for the harmlessness of many poisons, such as snake poisons, when taken into the stomach, is to be found not in the destructions of these poisons in the stomach, but in the fact that albuminous substances pass only with difficulty through an intact epithelial wall. The intact skin-surface acts in a like manner as a protective wall against the introduction of poisons. An interesting phenomenon of immunity is observed in the case of certain animals, immunized to tetanus when inoculated through the blood, but which perish when inoculated into the brain. This immunity against hæmatogenous infection while the cerebral susceptibility is preserved is due to the fact that the antitoxin can only permeate the walls of the blood vessels to a very slight degree. If the blood vessels become injured, the poison introduced into the brain is harmless. Regarding the hereditary transmissibility of immunity, Behring believes that a true histogenic immunity has never been transmitted. Hæmatogenous immunity, that dependent on the presence of antitoxines in the blood, is trans-

missible, but only so far as the antitoxin passes from the mother to the foetus in the blood or milk. A father cannot transmit immunity. Behring distinguishes two kinds of immunity, an antitoxic or passive immunity, produced by the introduction of ready-made antitoxin, and an active or isopathic, induced by primary treatment with the toxin. There is but little difference between the resisting powers of animals immunized isopathically and those treated with antitoxin. There is no evidence that these animals possess any histogenic immunity. In all probability the immunity is dependent on the presence of the antitoxin in the blood. Experiments show that the susceptibility or the non-susceptibility of any species of animal is an unalterable thing. The few exceptions to this rule can be explained on the theories of variation, selection, accommodation and heredity. There are two kinds of poisons, humoral and cellular. Isopathic immunization is possible only with the latter class, those which have an affinity for the cells. The cellular poisons are of two classes, general and specific. As an example of the general we have carbolic acid, of the specific, the selective activity of the tetanus poison for certain cell groups. Isopathic immunity against general cellular poisons is scarcely possible. Cellular poisons, again, may be divided into those readily dialyzable and those not readily dialyzable. It is probable that only those toxins which are dialyzable with difficulty can be used for immunizing purposes. Improvements in the technique of immunization seem to have as their object the enlargement of the molecule of the toxin so that it will become less readily dialyzable. It is this difficult dialyzability that helps to explain the incubation period.

CUBAN MALARIAL FEVER.—(*Phil. Med. Journal*, Dec. 10.) Dr. William H. Thomson read a paper at a recent meeting of the New York County Medical Society, giving his experience with returned soldiers at the Roosevelt Hospital. Of 100 soldiers sixty-three were actively febrile. The malarial plasmodium was found in ninety per cent. of all cases, the commonest form being the crescentic. In by far the larger number of the febrile cases the usual delirium was replaced by a peculiar taciturnity. The most striking features were the marked anæmia and severe prostration. Sixty-five of the cases were treated with large doses of quinine, arsenic or Warburg's tincture. The quinine acted most efficiently in cases marked by distinct periodic remissions, and Warburg's tincture was still more efficacious, but arsenic was of doubtful benefit. Cold baths were used in only

six cases, but were not well borne, and failed to control the fever. One group of cases was treated by administering, twice daily, 1 gm. each of quinine and powdered ginger, and 15 c. c. of paregoric, and another group was treated with Warburg's tincture. In the first group in one-half the cases the temperature permanently fell to normal within twenty-four hours, and the patients were discharged within ten days. In 20 % the fever did not reach normal until thirty-six to forty-eight hours; and in 10 % the treatment had to be stopped on account of nausea; in 5 % the treatment failed to control the fever. Only two of the patients exhibited the usual effects of opium; on the contrary they aroused from their lethargy. Of the cases receiving Warburg's tincture as a treatment 15 % reached normal in twenty-four hours, and in the remainder the fever was not controlled. All of these cases recovered in about twenty-four hours under the paregoric treatment. Sir William Roberts claims that the anti-malarial properties of opium reside in an alkaloid commonly called "narcotin," but which he says is better described as "anarcotin." Dr. Thomson added that in the cases just reported the opiate had acted the reverse of a narcotic—rather as a general cardiac and nervous stimulant.

HOSPITAL AND CLINIC NOTES, ETC.

LACERATED WOUND OF THE ARM.—De G., aged 50, entered New Haven Hospital, June 18, 1898, with the history that while working around a milling machine his hand was caught between the rollers. The examination made by Dr. W. W. Hawkes, the attending surgeon, showed that the forearm was crushed off just below the elbow, with the tissues of the arm more or less lacerated, and the skin completely gone from the arm and from part of the shoulder and pectoralis major muscle. The weakened condition of the patient made it necessary to wait a few hours, hoping the patient might recover from the shock of the accident. Stimulation with strychnine, whiskey, and saline enemata was necessary. At the end of three hours, his condition being no worse, it was decided to operate. Dr. Hawkes, assisted by Dr. Carmalt, performed the operation. So much of the skin was torn away that it was evident that skin flaps could not be secured to cover the wound after a shoulder disarticulation. Therefore the clavicle was sawed at the junction of the middle and inner thirds. The outer fragment was

raised and the subclavian artery and vein were ligated. The muscles, nerves and vessels were then cut. In the back the scapula was dissected out, and the scapula, arm, and outer two-thirds of the clavicle removed. The flaps were brought together and found to just approximate. Silk sutures were used and a rubber drainage tube inserted. During the operation the heart was very weak, demanding constant stimulation, and part of the time no pulse could be felt in the radial or temporal arteries. Temperature 98.2° (axilla), pulse 88, respiration 30. Saline enemata and stimulants were repeatedly given after the operation. June 19, patient's condition good, though the temperature has risen to 100°; treatment, strychnine, nitroglycerine, whiskey and milk and lime water. June 20, condition about the same, though there was a slight delirium; treatment, whiskey and sodium bromide when necessary. Wound was dressed to-day; considerable discharge appearing. June 21, patient's condition improving, the wound apparently healing. At no time after June 22 did the temperature rise above 99°; the wound healed by first intention, the patient made an uneventful recovery, and was discharged, cured, August 26.

ITEMS OF INTEREST.

At the recent Connecticut State examination John McKone and E. R. Pike were successful candidates. There was one candidate conditioned and one rejected at this examination.

There are two cases of smallpox on Lamberton street. The patients came from Jersey City before they were taken sick.

Professor Roentgen has resigned from the University of Würzburg, where his experiments leading to the discovery of the X-rays were conducted, and has accepted the position of professor of physics at Leipsic.

Dr. Benjamin Lee, secretary of the State Board of Health of Pennsylvania, reports thirty-six cases of smallpox occurring in the state since December 20.

The treasurer of the New York Saturday and Sunday hospital fund has received \$14,000 from contributions at the Saturday and Sunday collections in churches and synagogues.

Admiral Dewey has cabled a recommendation that a naval hospital be established in Cavite, where he says there is a building already available large enough for twenty beds.

The Massachusetts Hospital for Epileptics, at Monson, which opened last May, is already crowded, and an appeal will probably be made to the next Legislature for funds so that additional room can be provided. The original plan was to furnish accommodations for 200, but 208 have already been taken in, and many more should be admitted. There are said to be 4,000 epileptics in the state, and the doctors say there are 200 in Hampden county. About 700 are in public institutions, mostly insane asylums.

Tuberculosis, according to the French War Office reports at Algeria, occurs at the rate of 1 to 36.9 among the Jews and in all other races at the rate of 1 to 9.3, showing again the striking immunity of the Jewish race to the inroads of bacteria.

After repeated scourges of yellow fever along its coast, the Government of Mexico has roused itself and ordered an extensive system of sewers and the latest American methods of sanitation for Vera Cruz and Merido, in an endeavor to stamp out the fever at these points.

The Jenner Institute of Preventive Medicine recently received the gift of £250,000. This sum is to be expended in erecting buildings for sanitary research in one of the poorest parts of Dublin, where investigations will be conducted bearing upon the nature, causes and prevention of various diseases.

A new chemical compound has recently been brought forward as a treatment for tuberculosis by Dr. Schwartz, which he names "Thicol." Chemically it is sulphoguaiacolate of potassium, $\text{C}_6\text{H}_5\text{OH}\cdot\text{OC}_6\text{H}_5\cdot\text{SO}_3\text{K}$. This preparation is claimed to possess the following advantages: It is odorless, it is soluble in water, it has no irritant action on the mucous membrane, and it is readily absorbed. The preparation is reported to be well tolerated, and may be administered without inconvenience to the extent of about two hundred grains daily. Under its influence the appetite is said to return, strength increases, and the patient gains flesh. The cough is diminished rapidly in intensity and frequency, and expectoration becomes less in quantity and less purulent, the night sweats disappear, and the general condition improves.

A committee of the State Senate of New York, appointed at the last session of the Legislature to consider the advisability of establishing a state home for consumptives, held a meeting in New York city on December 13, when several experts in pulmonary disease appeared before the committee, and urged the recommendation for such a sanatorium in the Adirondacks.

The cigarette has been declared by the Supreme Court of Tennessee not to be a legitimate article of commerce. This decision was rendered in a case brought to test the law passed by the state Legislature prohibiting the sale of cigarettes. The court holds that the law is constitutional and must be enforced.

In the report to the surgeon-general of the Marine Hospital service, of an inspection of the leper settlement at Niolokai, Dr. D. A. Carmichael recommends that measures be adopted to control emigration to the Continent from the Hawaiian Islands and other places which may be regarded as endemic foci of leprosy. These measures, he says, should consist of a careful inquiry into the family and personal history of each emigrant, a rigid physical examination and disinfection of all his effects. Similar precautions should be taken at the port of arrival, and a record of the destination of the immigrant should be preserved in order that he may still be kept under observation by the health authorities where he resides.

OBITUARY.

1842.—Dr. Horace Burr died of pneumonia at Newcastle, Delaware, on January 10. Dr. Burr was born at Haddam, Conn., on December 13, 1817, and was a direct descendant of Rev. Peter Buckeley, the founder of Concord, Mass. He graduated from Yale Medical School in the class of 1842, and immediately began the practice of medicine at Westbrook, Conn. Here he soon obtained a prominent position among professional men, which he held until, at the age of 51, he was compelled to withdraw from active work and seek health in the milder climate of Delaware. Regaining his strength, he continued his practice until a short time before his death. Dr. Burr was an earnest student of history and literature, as well as of medicine, and wrote a valuable history of the Swedes.

1866. Dr. M. N. Chamberlin died at his home in Cheshire, January 10, of apoplexy. Dr. Chamberlin was sixty-two years of age and had been a practicing physician in Cheshire for thirty years. He was chairman of the School Board Library Association, in which he took great interest, and chairman of the Board of Health in Cheshire. The Doctor was a member of the E. A. Doolittle Post, G. A. R., and also a member of the New Haven County Medical Society and the Yale Medical Alumni Association. He was a graduate of Yale in both the Academic and Medical departments, graduating from the Medical School in the class of 1866.

ALUMNI AND SCHOOL NOTES.

Prof. Charles S. Minot, professor of histology and human embryology in Harvard University, will deliver the annual address in medicine before the graduating class at the coming commencement.

Benjamin Moore, M.A., assistant professor of physiology, took a flying trip to England during the holidays and was married.

'31—Dr. C. Ayres, the oldest living graduate of the Yale Medical School, was seriously injured during a fire at his home in Stamford on December 29.

'91—Dr. Fred. O. Chamberlain has changed his address to 1010 Sutter Street, San Francisco, Cal.

'95—C. J. Bartlett, M.D., assistant professor of pathology, has returned from his six months' stay in Germany and has resumed work with his classes.

'96—Dr. J. S. Maher has opened an office at 215 Orange street, New Haven.

'98—Dr. R. M. English began his term of service at the Bridgeport Hospital January 1.

'98—Dr. J. J. Cohane began his term of service at the Norwich Hospital January 1.

'98—A. H. Thomas, M.D., has recently recovered from a severe illness.

'98—Robert C. Sellew, M.D., has accepted an appointment as interne at the Elizabeth General Hospital, N. J.

'98—C. A. Rider, M.D., has recently received an appointment to the Willard Parker Hospital of New York City.

'98—F. W. Hulseberg, M.D., has finished his course in the Colored Hospital, New York City, and has since been substituting in Bellevue Hospital.

1900—Frederick Coonley took a course in the Broome Street Lying-in Hospital during the Christmas vacation.

1900—H. C. Pitts substituted in the New Haven Hospital during the Christmas vacation.

BOOK REVIEWS.

Atlas of Legal Medicines.—By Dr. E. Von Hoffmann, Prof. of Legal Medicine and Director of the Medico-Legal Institute of Vienna; Edited by Frederick Peterson, M.D., and Aloysius O. J. Kelly, M.D., of New York. 56 Plates in Colors and 198 Illustrations in Black. W. B. Saunders, Philadelphia.

This work is a new departure in Legal Medicine. The author, availing himself of the modern advances in photography, lithography and wood engraving, has placed before his readers pictorial illustrations of important medico-legal questions which one could scarcely find by laborious researches, in the largest libraries. Nearly a hundred figures in black and several colored plates illustrate congenital deformities, injuries of the female genital organs by rape and other injuries, showing by illustrative cases what no ordinary practitioner would see in a long life. Fractures of the skull, contusions of the brain and lungs, and cerebral hemorrhage are profusely illustrated and clearly described. Stab wounds are shown and compared with the instrument producing them. A great variety of wounds in cases of murder and suicide greatly aid one in diagnosing important questions as to the mode and cause of death. Gunshot wounds and saber wounds in great variety and position are shown. Twenty-nine figures show deformation of projectiles. Burns and scalds are also illustrated. Different positions of the rope used in suicide, by hanging, and the marks left upon the neck are shown. Several fine figures, showing the appearance and positions of the hand in cases of drowning, are given. Twenty colored plates show the appearances of the stomach and other organs, in cases of poisoning. This book gives clear and vivid illustrations of the most important cases in legal medicine, and deserves a place in the library of every practitioner. The enterprising publisher, W. B. Saunders, of Philadelphia, deserves the thanks of every student of legal medicine, for bringing out an American edition of this most attractive and valuable work.

M. C. W.

BOOK NOTICES.

Twentieth Century Practice.—An International Encyclopedia of Modern Medical Science, by leading authorities of Europe and America. In twenty volumes. Volume XVII, Infectious Diseases and Malignant Neoplasma. Edited by Thomas L. Steadman, M.D. Published by Wm. Wood & Co., New York.

Saunders' Pocket Medical Formulary, with Posological Table, Formulæ and Doses for Hypodermic Medication, Poisons and their Antidotes, etc., etc. By Wm. M. Powell, M.D., author of "Essentials of Diseases of Children," etc. Fifth edition, thoroughly revised. Price \$1.75. Published by W. B. Saunders, Philadelphia, Pa.

A Text Book of Mechano-Therapy. (Massage and Medical Gymnastics.) Especially prepared for the use of medical students and trained nurses. By A. V. Grafstrom, B.Sc., M.D., late Lieutenant in the Royal Swedish Army, etc. With eleven pen and ink sketches. Price \$1.00 net. Published by W. B. Saunders, Philadelphia, Pa.

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A CONTRIBUTION TO THE KNOWLEDGE OF THE MULTILOCULAR ECHINOCOCCUS CYST OF THE LIVER.

BY DR. HORST OERTEL.

[From the Microscopical Cabinet of the Physiological Laboratory of Yale University, New Haven.]

Our knowledge of the multilocular form of the cysticercus *tæniæ echinococci* is of comparatively recent origin. Before 1856 such cases, as is well known, were described and classified as colloid cancers. It is indeed strange to see how Zeller* in examining such a case in 1854, on finding several well defined echinococci, was unable to establish the true character of this tumor, describing the case simply as an unusual complication of the genuine colloid cancer. At two meetings of the Würzburger Physikalisch-medizinische Gesellschaft, on March 10 and May 12, 1855, Virchow read a paper "on the multilocular, ulcerating echinococcus tumor of the liver."† In this paper an exhaustive description of a case is given,‡ the identity of the small multilocular cysts with echinococcus cysts demonstrated, the whole condition separated from colloid cancers, and established as a well defined disease of the liver. He very soon had the satisfaction that Buhl of München, who previously had reported a case of colloid cancer, in a personal letter acknowl-

* *Alveolarcolloid der Leber.* Inaugural-Abhandl. Tübingen, 1854.

† *Verhandlungen d. Würzburger physik. med. Gesellschaft.* Bd 6, 1856, p. 84, and Buhl's letter to Virchow, *ibid.* p. 428.

‡ This case was clinically studied by Gerhardt, who at that time was a student in Würzburg under Rinecker's guidance.

edged the identity of his case with that of Virchow, adding that he himself had come to that conclusion some time before when he had had occasion to examine an echinococcus sac of the liver.

Since then about 100 cases have been reported. In the majority of these the liver has been the organ affected, but intestines, peritoneum, omentum (Heschl), as well as uterus and anterior abdominal wall (Scheuthauer), duodenum (Böttcher) and suprarenal capsule (Huber) each furnish a case. The bones also seem to be affected, though less frequently. Vierordt includes here the cases of Kanzow, Trendelenburg and Müller.*

Of greatest interest is the geographical distribution of the multilocular echinococcus. In certain districts this form is endemic and almost excludes the unilocular variety. Of ninety cases, collected by Vierordt, including seven cases of Nahm, the distribution was as follows: Bavaria 39, Switzerland 21, Württemberg 21, Austria 7, Russia 4, Prussia 2 (one of which occurred in Hohenzollern), Baden 1, and the *United States* 1.

The most recent, extensive and excellent study of A. Posselt† in Innsbruck has added greatly to this. According to this author we must include the Tyrol in the list of districts in which the multilocular echinococcus is endemic, so that now the preferred territory is represented by Bavaria, Switzerland, Württemberg and the Tyrol. Posselt furthermore points out that the relative frequency is greater in Tyrol than elsewhere, that here also the multilocular variety almost excludes the unilocular form, and that it seems as if on the whole it is becoming less frequent in Switzerland, Bavaria and Württemberg, but is on the increase in the Tyrol. In the period from 1892 to 1897 there were among 5,720 patients in the medical clinic at Innsbruck thirteen cases of multilocular echinococcus (2, 27: 1,000), the ratio of the hydatid to the multilocular being 11:26.

Among the inhabitants of the United States, born in this country, the multilocular kind is, I think, unrecorded. The only case, as far as I am aware, (reported by Prudden‡) occurred in a German, and the case which I shall describe below was in a German who had emigrated from the southern part of Saxony, near the Bavarian boundary. The close study of the geographical range of this variety is of great importance,

* Cited by Mosler and Peiper, *Thierische Parasiten*, in Nothnagel's *Spec. Path. u. Ther.* Bd 6. Wien. 1894.

† D. *Echinococcus multilocularis* in Tirol. *Deutsches Archiv f. Klin. Medizin.* Bd. 59. 1. und 2. Heft. 1897.

‡ Delafield and Prudden. *Pathological anatomy*, etc., 5th ed. 1896.

because it points strongly towards the fact that a peculiar form of *tænia echinococcus* is responsible for this disease.

And, indeed, this idea of a specific kind has occurred to, and been partly entertained by several investigators. Vogler draws attention to a difference in the hooks, they being longer (in the ratio of 4 to 3) in the multilocular echinococcus, presenting also less of a curve. Leuckart, however, does not accept this as especially characteristic. More attention must be paid to the experiments of Mangold who fed two young dogs, just weaned, with multilocular echinococci. They produced four *tæniæ* in the two dogs. These were characterized by greater length, less curved hooks, long and thin posterior segments, and knob-shaped, protruding pedicles (*knaufförmig vorspringendes Wurzelende*). The intestinal contents of one dog were given to a pig twelve weeks old. After four weeks the liver showed two white foci, the size of a hazel nut. These were cavities with a multilocular, sinous arrangement. On the other hand we have the observations of Klemm, who, on feeding a dog with multilocular echinococci, was unable to differentiate the resulting tape worms from the ordinary form of *tænia echinococcus*. But this experiment is open to criticism; for we do not know whether these echinococci did not already exist in the intestines of the dog at the time of feeding.

This leads us to the morphological character and formation of the tumor with the most important question: what are the conditions on which this peculiar structure really depends?

To summarize and sketch briefly: we have a large primary tumor which is characterized by numerous, irregularly formed cavities, separated from each other by connective tissue bands, each lined with the echinococcus membrane and containing gelatinous material, the whole of which gives to the tumor an aleveolar, colloid appearance. This primary tumor tends strongly to central disintegration, so that in older tumors more or less of a cavity is formed filled with a thick, yellowish, bloody, pus-like fluid which frequently contains haematoidin crystals. But besides this primary tumor which is surrounded by a thick connective tissue capsule there have been observed smaller, isolated cysts in the parenchyma of the liver, or, as in the case of Virchow, rosary-like processes, projecting in different directions.

Now two possible explanations of this may be given; we may have either an invasion by a great number of germs or a continuous external, exogenous, proliferation originating from one point. Evidence, given by the disease itself

as well as by comparison, indicates that the second explanation is the more probable one. Of especial interest in connection with this point is the fact that we are already acquainted with a similar form of another cysticercus, the *cysticercus racemosus*, described by Zenker and others, in which growth takes place by proliferation into the neighboring tissue, and it may, therefore, be assumed that the same conditions exist in the formation of the *echinococcus multilocularis*.

Such, then, is, in brief, the present status of our knowledge of this disease. Its great infrequency and the uncertainty concerning almost all conditions bearing upon it warrant the publication of any observations, no matter how incomplete they may be, and I shall, therefore, relate a case in which, owing to unfavorable circumstances, a considerable amount of clinical and anatomical data is lacking, but which, I think, represents a fragment well suited to be introduced within the scope of the facts already known, and which may be of value to those engaged in the further study of this most interesting disease. The specimen, as well as the history, I owe to the kindness of Dr. L. W. Bacon, Jr., of this city.

The patient was a man 39 years old, who was a laborer in a foundry. He was born in Saxony, near the Bavarian boundary, and had lived in this country for ten years, was married, and had healthy children. His health had been good up to three years ago, when he experienced occasional attacks of colicky pains, sometimes strong enough to oblige him to go home from his work. These colics, however, never lasted long. His main difficulty dated from February 20, 1898, when he called in his physician, Dr. Marvin Smith, for advice. His condition remained fair until July. He complained then of a dysenteric diarrhoea and was jaundiced. The liver was enlarged. Under the usual treatment of a catarrhal jaundice he improved sufficiently to go back to work in two to three weeks. He furthermore received free doses of potassium iodide with the apparent effect of reducing the size of the liver and a decrease in the jaundice. Towards the autumn of the year, however, he gradually became worse, and Dr. Bacon was called in consultation on November 15. The patient then was somewhat emaciated and deeply jaundiced. He had diarrhoeal stools, but their dysenteric character had ceased, they were liquid and rather foul, but not clay-colored. The appetite was voracious and there was no distress after the meals; the tongue was moderately coated. The physical examination showed the abdomen considerably distended in its upper portion. A mass, apparently

the liver, extended for a hand's breadth below the free border of the ribs of the right side. It extended into the left hypochondrium, reaching in the middle line nearly to the umbilicus. In the epigastric region was a boss or circular prominence appreciable to the eye and about twelve to fifteen cm. in diameter. On palpation it seemed to be slightly raised above the rest of the liver substance. On percussion a fluctuation wave was clearly discernible, which was obscurely transmitted to the right. The liver dulness extended to the nipple of the right side. The tumor itself was painless on pressure. The spleen could not be differentiated. The heart was displaced outward and upward. Respiration shallow and rapid. The only symptoms were from pressure, cardiac difficulty and dyspnoea. The colic had not been present for some weeks now. The provisional diagnosis of *echinococcus hepatis* was made and operation recommended.

Operation November 18. (Dr. Bacon, assisted by Drs. Verdi and Marvin Smith.) An incision was made in the median line directly over the tumor. There was free hemorrhage from the congested abdominal wall and it was found impossible to identify any of the peritoneal layers. After cutting through the muscles the knife entered tough fibrous material, the wall of the cyst with no liver substance intervening. The peritoneal cavity was shut off by adhesions. A trocar was pushed into the cyst and, on withdrawing, a considerable quantity of a thin, turbid, light-brown fluid spurted out. The total quantity of this was about four liters, of which about 200 c. c. were saved for examination. After the wound in the cyst wall had been enlarged with the scalpel about ten cm. the hand was thrust into the cyst; it was flushed and sponged dry. The danger of peritoneal infection having so been removed, the anterior abdominal wall was dissected up and worked down to the free edge of the liver, which extended nearly to the umbilicus. A fringe of apparently normal liver substance at the free border of the liver about two cm. broad was discovered, and this apparently normal liver substance formed a collar, as it were, around the cyst. The cyst itself was found to be very irregular, extending some 25 cm. from right to left. The condition then was: A main cavity nearly spherical, about the size of a man's head, in the epigastric region, which, on going towards the right, seemed to be further removed from the free border of the liver, so that in the right mammary line the amount of apparently uninvolved tissue anterior to the cyst was greater, there being about 3 to 5

cm. between the free border of the liver and the cyst. In the right hypochondriac region there were various irregular pockets; in the region of the hilus of the liver these pockets were in places large enough to admit two fingers. The anterior wall of the cyst was now resected over all the area which was adherent to the abdominal wall, a space twice the size of the hand. Heavy silk sutures were passed through the abdominal wall and through the edges of the wall of the cyst, it being impossible to do a radical operation. The remainder of the cyst cavity was filled with 4 to 5 yards of gauze, the wound not being closed, but the edges left wide apart. There was very little hemorrhage; in places where the apparently unaffected liver substance had been cut through, there was more of it, which, however, was easily controlled by deep sutures. Considerable difficulty was experienced in pushing the needles through the firm walls of the cyst.

The man lived for thirty hours after the operation. The action of the diaphragm was considerably interfered with by the fact that the liver was anchored to the abdominal wound. No vomiting. The pulse remained pretty good, not over 120 beats per minute, until about one hour before death. When the dressing was removed about twenty hours after the operation there had been very little oozing. The man apparently died of sudden collapse. No autopsy was obtained.

To sum up: The primary tumor in this case was situated in the left lobe of the liver and had apparently caused absorption of all the parenchyma of the left lobe, with the exception of a narrow collar, varying from 2 to 5 cm. in width, which represented the free border of the liver. It was adherent to the abdominal parietes over an area roughly estimated as 10 by 15 cm. Where this adherent part of the cyst wall was resected there did not appear to be any further extensive adhesions either to the abdominal wall or the viscera. In the non-adherent portion, as far as the upper surface of the liver was concerned, there appeared to be a thin layer of parenchyma, varying from 1 to 2 cm. in thickness between the wall of the cyst and the upper surface of the liver. In the right lobe of the liver the cyst did not appear to have brought about such extensive destruction.

Fluid and specimen were immediately brought into the laboratory and examined.

The fluid was thickish, grayish-brown, opaque, and odorless. On microscopic examination it showed an abundance of pus corpuscles, many red blood cells and a large number of beauti-

ful haematoidin crystals, together with more or less debris. Nothing else that was characteristic could be discovered.

The specimen itself is represented in Fig. 1. It consisted of a large cavity about 20 cm. in diameter, enclosed by a very thick connective tissue capsule measuring at points not less than 1 cm. nor more than 2.5 cm. in thickness (*a*). The inner walls of this capsule (*g*) were extremely ragged, this being caused by irregularly shaped cavity-like depressions in the substance of the capsule. These measured from 2 mm. to 7 mm. in length and depth. The color was a dark greenish-yellow. The capsule on its cut surface (*a*) was white, hard and smooth. In it were embedded, and mostly irregularly distributed, small cavities, lined by a membrane to be distinctly differentiated from the capsule, and filled with a gelatinous white mass, which could easily be squeezed out. In some places these were solitary, in others they had aggregated in bundles (*b*) or formed rosary-like processes (*c*). The outer surface of this large capsule was smooth, but showed a reticulated thickening and opacity of the peritoneum indicating a certain amount of perihepatitis hyperplastica. In the right hand portion of the resected piece was the tip of the gall bladder (*d*), which was empty and contracted. Just to the right of the gall bladder was a mass of apparently healthy parenchyma (*e* and Fig. 2), upon the surface of which there were irregular hard yellow nodules, giving the appearance of a progressive invasion of healthy tissue from the main tumor. These nodules on incision proved to be cavities from 1 to 5 mm. in diameter (*f*) and of the same character as those previously found in the capsule surrounding the large cavity. The whole was intensely jaundiced.

I. Microscopic examination of the fresh specimens.—Razor sections were made and examined in a weak solution of sodium chloride and in glycerine, of pieces of the capsule and the parenchyma of the liver. They revealed the following conditions:

The *capsule* showed a thick fibrous stroma of the general character of mature connective tissue, only towards its external layers the young cells became more abundant. This stroma surrounded cavities, either solitary or more often forming an alveolar structure of round, or elongated, or irregular shape. They differed in size from less than 1 mm. to 3 or even 5 mm. in diameter. Every one of these cavities was lined by a delicate membrane showing the characteristic-lamination of the echinococcus cysts. Some were filled with granular material, in others this had evidently fallen out. (Fig. 3.)

Sections made from the *parenchyma* showed a far advanced hepatitis interstitialis, with masses of liver substance strongly infiltrated with biliary pigment and small cells. Besides the cysts already described above, another formation could here be observed. This consisted of large elongated, egg-shaped cavities, around which strong reactionary changes of the liver tissue could be seen. These cavities were not lined by a single laminated membrane, but contained a peculiar net-work-like arrangement of the membrane, forming loops here and there, which enclosed granular material. (Fig. 4.)

Similar formations have already been observed by Buhl and Virchow, and the latter is of the opinion that they may represent a stage of development in the growth of the echinococci. Virchow was able to find in the interior of larger cysts a peculiar, starlike, anastomosing cellular net-work, growing into a larger system of canals in which large cysts with thick membrane developed from granular bodies. It might also be added here, that, as in many other multilocular cases, no scolices or hooks were found.

II. Microscopic examination of hardened and stained specimens.—Pieces, after fixing in 10% formalin, were hardened in alcohol, embedded in paraffin, and stained with haematoxylin and eosin. In the specimens so obtained the conditions formerly described could be studied more in detail. The bile-stained and infiltrated masses of liver substance were compressed by thick bands of fibrous connective tissue. In some places the liver cells had entirely disappeared. With regard to the appearance of the cysts, the following must be added: In several situations of the apparently not involved *parenchyma* there were observed changes which undoubtedly represent early stages of cyst-formation. A certain area, varying in size and shape, appeared to be made up of fine, structureless, hyaline, not amyloid, material, staining red with eosin. With a stronger power, and especially in little more developed areas, this appeared to consist of a fine network of anastomosing very thin threads. In more advanced stages a central opening and beginning separation of the material into laminae could be observed. This area was enclosed by one or two zones of small cell infiltration, which towards the periphery would gradually yield to normal liver substance or would meet the periphery of a like formation. (Fig. 5.) Such areas were observed sometimes isolated, but more often they occurred side by side together in groups. In some places their relation to the bile ducts and surrounding tissue indicated that they started from the blood ves-

sels; in others, they must have originated from the lymph spaces.

In their subsequent development these areas presented a picture which is represented in Fig. 6. Here an already well-formed cavity is evident, the peculiar shape of which is dependent upon the formation of the membrane still in connection with that portion of the wall from which it originated; in other words a young echinococcus.

Another stage appears in Fig. 7, in which, apparently following the lymph spaces, by continued exogenous formation, one of the rosary-like processes is produced.

Finally, it must be especially mentioned that the bile ducts showed no relation to the cysts whatever. The changes in them were those always observed in chronic icterus and secondary to the hepatitis.

We have seen above that at the present day the formation of the multilocular echinococcus is regarded as taking place, not as the result of an invasion by a great number of germs, but as the result of continued proliferation into the neighboring tissue. About the primary starting point, however, there is not, as yet, full uniformity of opinion. Schröder van der Kolk was of the opinion the echinococci originated from bile ducts; Virchow, and later Klebs, looked upon the lymph channels as the starting point, and Leuckart held the blood vessels responsible.

Our case, as far as observations made with such limited material go, indicates that in echinococcus multilocularis there exists a continued proliferation and cyst formation into the adjoining tissue. The formation of isolated cysts as well as strings or bundles of cysts which originate from one focus, but are situated in relatively unaffected parenchyma, would indicate that germs, which are probably produced in other portions of the liver, are carried along until they lodge and propagate a new brood in suitable places.

The carriers are here the blood vessels and the lymph channels, but not the bile ducts.

It is of great interest that the two cases having so far been observed in this country occurred both in Germans. Prudden does not state where his patient came from, but we know that our patient emigrated from very near one of the preferred districts.

It is also quite noteworthy and strange that the condition did not show itself until considerable time after settlement in this country. Prudden's patient had been in the United States

for five years, and our patient even ten. The question might be raised whether infection in these cases had taken place at home at all.

We do not know much about the time that may elapse between infection and manifestation. There are several views as to how the invasion by echinococcus eggs takes place.

Following Leuckart, it is usually believed that the embryos actively penetrate the intestinal walls, in this way entering blood and lymph vessels, which carry them along.

Neisser, however, believes that embryos may only passively pass through the intestinal walls, just as other solid particles, for instance, silver granules, do. Again, it is also supposed that traumata may influence the location and development of the echinococci, a statement not generally accepted.

If we, therefore, do not believe that these patients were infected here, for which assumption there is little evidence, indeed, this late manifestation might be explained by either of the two views last stated. The embryos might have remained inactive in the intestines until by chance they were conveyed to the liver; but it seems improbable at least, that the embryos should have remained in the intestinal canal, in one case, five years, in the other, ten years. Or they might have remained inert or slow in development, until through some outside influence they were stimulated to a more rapid growth.

However, concerning all these points we as yet know very little. Posselt has promised us a monograph based upon an extensive study of the thirteen cases observed in Innsbruck, to appear soon. It undoubtedly will be of great interest and importance. I simply submit this case, as mentioned before, as a fragment to the history of this disease, which, perhaps, in one or two of its points, may prove of interest to one or another investigator in this line.

It remains my pleasant duty to express my sincerest thanks to those gentlemen who have given me valuable aid in the preparation of this article. Aside from Dr. Bacon, they are due to Dr. Moore, who has given me all the advantages of the physiological laboratory. Dr. Ferris has sacrificed much time in making the photographs, and Dr. Ely has put me under obligations by allowing me the use of his library.

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EXPLANATION OF PLATES.

Fig. 1. Shows the specimen in toto. The main cavity, with ragged walls (*g*) and numerous small cavities, is surrounded by the very thick capsule (*a*), which lodges a great number of echinococci cysts, either solitary or in bunches (*b*) or in rosary-like processes (*c*). Just to the right of the gall-bladder (*d*) is a piece of liver parenchyma (*e*) with small and larger cysts (*f*). *x* represents the free border of the liver, *y-z* indicates the median line of the body.

Fig. 2. The piece *e* is drawn somewhat enlarged. *a* is a piece sliced off from *b*, over which it fits. It shows the cysts in the liver parenchyma a little more in detail.

Fig. 3. Photograph of microscopic section showing general multilocular arrangement in a group of cysts. The open spaces are cyst cavities. The large lower one has retained some granular material. They are all lined with the laminated membrane, the structure of which is much more delicate than the photograph represents it.

Zeiss: DD. Projection eye piece 2.

Fig. 4. From a fresh razor section of the liver substance mounted in glycerine: a large elongated cavity with strong reactionary changes around it. Shows well the peculiar arrangement of the membrane forming loops, here and there lodging granular material. Zeiss: AA. Projection eye piece 2. Upper lens of condenser removed.

Fig. 5. Early cyst formation. Areas of hyaline material surrounded by one or two zones of small cellular infiltration. In one of the cysts an opening has already formed. Paraffin section. Haemat. Eosin.

Zeiss: AA. Projection eye piece 2. Upper lens of condenser removed.

Fig. 6. Later stage of cystic development. A cyst cavity which lodges at its base, the characteristic echinococcus formation which is still continuous with that portion of the cyst wall. Outside the membrane and enclosed within its loops is granular material. Paraffin section. Haemat. Eosin.

Zeiss: DD. Projection eye piece 2.

Fig. 7. Represents the development of cysts, following lymph channels, from one focus. This is well shown in the upper part of the field where the faint outlines of two just forming cysts are seen. Paraffin section. Haemat. Eosin.

Zeiss: AA. Projection eye piece 2. Upper lens of condenser removed.





FIG. 3.



FIG. 5.



FIG. 4.



FIG. 6.



FIG. 7.

A STATEMENT OF THE AIMS AND ACCOMPLISHMENTS OF THE CONNECTICUT STATE BOARD OF HEALTH.*

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The principal lines of work of the Board are three: First, the establishment locally of an effective and trustworthy sanitary administration in every town, borough and city in the State; second, the work of securing, preserving and tabulating the fullest and most accurate vital statistics possible; and third, a careful chemical and microscopical examination of the natural waters of the State, including wells, reservoirs and running streams. These are the three most prominent objects the Board is aiming to accomplish. Success in either of these directions has been marked by slow and inconstant progress to such results as have been attained. The Board is endowed with only advisory powers, and cannot undertake aggressive sanitary work, except as specifically directed by special legislation. Some State Boards have broader powers conferred upon them.

In the matter of organizing local sanitary administration in towns and cities, it has been a growth rather than an event, an evolution, the result of careful cultivation of some small germs in the public mind of stunted development and exceedingly frail vitality. At the time of the organization of the State Board of Health of Connecticut there was not one really efficient active local Board of Health in the State. It is true the people appreciated in a theoretical way the utility of a Board of Health, and provided by statute that in every town the "selectmen" and the justices of the peace shall constitute a Board of Health. But it was understood on all sides that their principal functions were to build as good bridges as the town could afford, keep the roads in repair, farm out the town paupers at the lowest possible cost to the town, get out the full party vote on election days, and if any cases of smallpox occurred, hire the cheapest doctor and some pock-marked par-

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ties to take care of them in the pest house. Such was the situation as regards public hygiene generally throughout Connecticut twenty years ago.

It was at once quite evident to the State Board that some new legislation would be necessary to any satisfactory improvement, and some futile efforts to impress the Legislature with the importance of the subject were made. A pumpkin hurled at an ironclad battleship symbolizes the impress upon the Legislature at that time. We learned once for all that sanitary reforms cannot be inaugurated in a Legislature. Kepler's laws of the planetary motions are not more unalterable. The law governing Legislatures is: Follow in sanitary matters—never lead. One reason is, there is no party politics in scientific hygiene. Another reason is, legislators are not sanitarians. The key to sanitary legislation is: Begin behind the Legislature—among the people who make legislators. Our experience, I believe, is in accord with the experience of all other States: that judicious hygienic laws have their foundation in an enlightened public sentiment. And that enlightenment must precede legislative enactments. Guided by these considerations, the State Board of Health of Connecticut has pursued the same methods which have been found necessary everywhere else as a prelude to the organization of practical public hygiene. Educate the people. Convince the common people, and especially the voters, that they have a personal and pecuniary interest in the public health. It is a tedious process; the progress is slow and often discouraging. It is like teaching school when there are more truants than attendants, and when the pupils question your authority and disrespectfully resist your teachings. But precept must be upon precept, precept upon precept, line upon line, line upon line, here a little and there a little, and with patience and perseverance old prejudices are eventually overcome, deep-rooted conservatism is gradually loosened, and new ideas get a lodgment. I will not detail the steps of such instruction. It is something that must be done, however it may be done best. Suffice it to say that in Connecticut, after twenty years of work, largely in the educational line, practical public hygiene has reached its present stage of advancement.

Permit me briefly to outline the prominent features of the present system of health administration in our State. One of the most satisfactory changes has been the elimination of party politics from this department of the public service, and the lengthened tenure of office of health officers everywhere. They

are no longer elected annually by popular vote, and consequently health officers need waste no time to repair political fences. We have, too, an official in Connecticut which is, I believe, peculiar to our State, and his analogue does not exist anywhere in the Union. He is a county officer. He must be an attorney at law. He is misnamed a county *health* officer, because his duties are executive, not sanitary. He is charged with the enforcement of the laws relating to public health, and those also relating to the registration of vital statistics. He appoints all town health officers, and can remove them and fill vacancies.

The health officers of the cities and boroughs are appointed according to the terms of their respective charters, but all are appointed for four years, instead of every year, as formerly, and none of them by the popular vote.

The health officer of each town is empowered to make local sanitary rules and regulations for his own town, which, after being legally promulgated, have the force and validity of law. In cities and boroughs, of course, their respective charters provide for the enactment of local ordinances. Under the advice of the State Board and of the county officers, who are attorneys at law, a code of sanitary regulations for towns has been drawn up, and by concurrent action and mutual agreement has been adopted by all the health officers, so that one system of rules prevails everywhere in the State, except in incorporated cities and boroughs.

The county officers are required to make an annual report to the State Board of their doings in each county. The local health officers also make annual reports to the board for their respective localities.

By an act of the last Legislature, every physician is required to report promptly to the health officer of his town the usual list of contagious diseases occurring in his practice. And during the first week of the following month the health officer is required to report the same to the State Board. He is also required to report immediately the outbreak of any epidemic. In addition to these sources of information, the registrar of vital statistics in every town is required to report during the first week in every month the total mortality in his town in the month preceding, together with the number of deaths from each of the most fatal diseases. By these means the State Board of Health is kept pretty closely in touch with the condition of public health in every part of the commonwealth, and publishes a result in a monthly bulletin.

The special distinguishing feature of our system is that these laws are effective. The reports are made, both by the

health officers and the registrars and the doctors; they are made promptly. It is quite easy to make laws that would fulfill every requisite if they were obeyed. Their failure is due to non-observance. Registrars, health officers and doctors all neglect them if left to themselves. The real question is, How can obedience be secured? Connecticut has solved that problem, and given the only practical solution that has ever been offered. It is an exceedingly simple matter, merely to impose upon one competent person in each county the duty of seeing that these legal requirements are observed. Personal supervision of their operation is as essential as the engineer is to the action of the locomotive. They will not work automatically. It is a remarkable illustration of legislative credulity to believe that laws so complicated, involving the concerted and periodical joint action of so many persons of varied occupation, would be carefully and uniformly observed without official oversight. They never have been so observed, and they never will be, except under supervision similar to that which Connecticut has provided. The supervision must be direct, vigilant and continuous. Every month each county officer notifies every delinquent in his county, whether he be doctor, registrar or health officer, that a repetition of his neglect will be followed by a prosecution. This is effective. There is a point to such notices that is appreciated.

The compensation of these officials is regulated by law, and is for service per diem. The county health officer is paid by the State at the rate of \$10 per day and expenses. The town health officer is paid by his town. It is the only bill concerning which the town has no option. It must be paid by the treasurer, if audited and approved by the county health officer. The State, however, knowing the propensity of doctors to undervalue their services, has with paternal regard provided that the pay shall not be less than \$3 per day.

ABATEMENT OF NUISANCES.

As regards the abatement of nuisances and the maintenance of sanitary conditions, the local officers are the executive, the supreme authority in their own towns. Any person aggrieved, however, by the order of a town health officer may appeal to the county officer, who, upon investigation, may vacate, modify or affirm the order of the health officer. These are always purely local conditions, in which the local health officer is the proper executive, acting in doubtful circumstances as to authority under the legal advice of the county officer, and in sanitary questions under that of the State Board of Health.

VITAL STATISTICS.

Our system of collection is townwise. In Connecticut every city and every borough is within the limits of a town. The town clerk in each town is the registrar of vital statistics of the town and the included city or borough. He issues permits for burial or removal of the dead only upon receipt of certificates of death legally presented. All doctors and midwives make returns during the first week of each month of all the births they have attended during the preceding month. Clergymen and others authorized to perform marriage ceremonies are also required to certify to the same each month to the registrar. Previous to the appointment of the county officers the regular performance of this duty was neglected by the great majority of those upon whom it devolved. A few prosecutions by the county officers, and the consequent penalties paid, have worked an astonishing reformation, and have speedily converted law-breaking clergymen, law-defying doctors and ignorant midwives into good, law-abiding citizens.

The improvement in the assembling of the vital statistics of the State is, in consequence, as nearly complete as is possible by any method. Another valuable feature of our registration work is the rendering to the State Board of Health in the beginning of every month a true copy of each certificate of birth, marriage and death occurring in the preceding month. The law requiring this has been in operation only since the first of July, 1897. The copies are made on cards and preserved at the central office, in the method known as the "card system." In this way are gathered into one office the attested copies of every birth, marriage and death occurring in the State. These are so systematically filed that the name of any person in a given town can be found without delay.

EXAMINATION OF THE NATURAL WATERS OF CONNECTICUT.

The special investigations of the Board of Health concerning river pollution and public drinking water began in 1886 as the result of an act of the Legislature providing for investigations concerning river pollution. Attention was first directed to a statistical inquiry into the amount of polluting material discharged into the several rivers known to be subject to a considerable contamination, and to facts relating to the area of watersheds and the flow of the streams. This inquiry resulted in the collection of much material of interest, not only concerning the amount of polluting material discharged into the

streams, but also concerning the nature of the chemicals used and discharged as waste material in some of the chief manufacturing industries of this State, especially certain of the metal industries and the manufacture of paper, silk and woollen goods and hats. The results of these researches were published in the tenth and eleventh annual reports.

During the time devoted chiefly to these industries, chemical and bacteriological examinations were made of the waters of some of the streams. The attempt to interpret the results of these analyses demonstrated at once a lack of that definite knowledge of the normal waters of the State which is necessary to serve as a standard by which to determine the amount of contamination in a polluted water. While, therefore, examinations of the polluted waters were continued, analyses were also made of unpolluted waters, with the view of establishing standards for the various parts of the State, so far as this is practicable.

The source of the samples for this class of analyses was for the most part of the public drinking water of the State, care being taken, of course, to select protected supplies. In these examinations attention was directed not only to those points concerning which comparative information was wanted, but also and especially to those having sanitary interest. The examination of the public drinking water supplies have included chemical and microscopical analyses, and in some cases bacteriological counts also, and, where practicable, an examination of the surroundings of the source of supply.

The chemical methods have been those of the ordinary sanitary analysis, such as experience has demonstrated to be of practical value, and, for the benefit to be derived from uniformity in reports, have been made to conform in their general features to those used in the work done under the direction of the neighboring State of Massachusetts.

The biological or microscopical analysis has consisted in the identification of the genera of the organisms not bacteria, and an estimation of the number of individuals of each in a given volume of water. The Rafter-Sedgwick method of sand filtration has been used.

In the earlier analyses, estimates of the number of bacteria, as determined by the methods of plate-culture, were made in samples specially collected and sent to the laboratory in an ice packing. The unsatisfactory conditions of collection and transportation, together with the variable results obtained, led to the abandonment of bacteriological determinations, except in special cases.

The systematic examination of our public water supplies, and the publication of the results, is believed to have been of great value to the State, especially by stimulating efforts on the part of the water officials to improve the quality of the water furnished by greater care in the management and oversight of reservoirs and watersheds.

In connection with the examination of sewage-polluted streams, attention has naturally been directed to the composition of sewage and the methods of purification. Accordingly, analyses have been made of crude sewage and of the effluent from filter beds. Mechanical analyses of samples of sand have also been made from all of the filters in those places where the purification of sewage by sand filtration has been adopted.

In consequence of these investigations relating to the purity of water and the proper disposal of sewage, public attention has been specifically directed to their importance as a factor in public health, and the following towns and cities have constructed filter beds for the disposal of sewage by land filtration: Meriden, Bristol, Danbury and Litchfield, and others are seriously studying the problem for immediate purposes.

The foregoing are the three prominent objects which the State board of Connecticut is striving to accomplish, to wit, good sanitary administration for every community in the State; an accurate and full record of vital statistics of the State, and a careful inquiry into the natural waters of the State and of the dangers of contamination. The legislation of Connecticut in regard to these objects is now in a fairly satisfactory condition, and, excepting in some matters of detail, is promotive of our efforts.

ENDOMETRITIS, CONGESTION, OR WHAT?

BY W. L. BARBER, M.D., WATERBURY, CONN.*

For a long time I have been very much in doubt whether the word "endometritis," as we have been taught to use it, is the proper term to clearly indicate the pathological state of the lining membrane of the uterine canal. I will grant that in most cases it fulfills the duty and defines the condition, but what I desire to prove to-night, if I can, is that the disease is capable of a division not clearly described by tissue changes, but enough marked as to require different forms of treatment. The one requires the surgical, the other the medical treatment, as dependent on the cause.

Classifying endometritis, thus, from causes, we have the simple, septic and specific. At the present time we know the causes of the two last classes; that they originate by the extension through the vagina or through the tube or by the introduction through the lymphatic system of septic material, an infection or micro-organism. Such cases are inflammatory in character, but it is not the endometrium that is alone affected. The uterus, as a whole, or the tubes, or the adjacent tissues, undergo the same action, and many times are the primary seats of disease. Then, if we have endometritis, we certainly have a metritis, a vaginitis, or a salpingitis, the mucosa becoming diseased by extension, just as a forest fire may spread from field to field. Such cases present, generally, distinct evidence of an inflammation of the endometrium, such as pain and temperature, and some pathological condition external to the canal can invariably be found to answer for it. If this is true, why allow longer the endometrium to bear the burden of this classification. I will not say that simple endometritis never occurs, but I believe it is much more rare than is generally considered; but that it does occur, I am satisfied, and when so, it is merely symptomatic of hypertrophy or atrophy of the mucous membrane.

In the first condition, according to some pathologists, the follicles are many branched and tortuous with thickened epithe-

* Read before the Waterbury Medical Association, February 13, 1899.

lium. The vessels are enlarged and increased in number, so that the slightest touch to the epithelium causes bleeding, and the general aspect of the membrane is of increased growth and excess of nutritive fluid. The condition known as "fungoid" is thus produced. The same growth occurs after abortion, when a portion of the decidua becomes adherent. If the membrane is atrophied, the follicles with their epithelial linings are decreased in size. The tissue is not so rich in cell life, and the whole membrane is below the normal in thickness. The connective tissue is increased, causing a destruction of the gland tissue. Non-development and malposition are the causes of this form of endometritis. Such conditions of the endometrium are not truly inflammatory. They are due to an altered circulation, by pressure or flexure, and as a result the nerve functions are perverted—over-congestion of the vessels takes place, and dysmenorrhœa is often excessive.

A young woman comes to our office complaining of menstrual pain, and in the interval rather excessive leucorrhœa. She looks well, physically is well, but neurotic and not unlikely erotic; every organ is in its proper place. There is no temperature, only obstinate constipation. How common for us all to say, "Oh! you have endometritis, you must have local treatment to the uterine canal," or to state, if up to timely fadism, with an anxious look on our face, "You must have an operation, your womb must be scraped;" on the principle, I suppose, that the cavity, like a foul sink or cesspool, should be cleaned whenever a good opportunity occurs.

The man with the love of surgery inborn will want to scrape and cut. The man with the medical bias will want to make applications. Now, in regard to this woman's condition, what is more reasonable to believe than that this leucorrhœa is due to an enlargement of the uterus itself; a condition due to obstructed circulation from fecal masses, or a general congestion of the sexual organs from thought or act of the possessor herself. Would not the mucous glands of the uterus or vagina relieve themselves of this over-distended condition by a discharge? a leucorrhœa? I believe so, and it seems reasonable, and furthermore, that this is a correct view of the cause of such so-called cases of endometritis, is no doubt confirmed by the experience of some of you here who have cured completely all its symptoms, by removing the pressure of intestinal masses exciting the activity of the portal ducts, with small doses of mercury, restoring the circulation, and removing by depletion the congestion of the organ by hot water and the glycerine

tampon to the vault of the vagina, without even introducing a sound into the cavity. This has been my experience. This subject has been of no little interest to me, for a man with over twenty-five years of experience can retrospect with advantage.

In the early years of my practice we did not recognize peri-uterine and para-uterine inflammation, the word "salpingitis" was not coined, and the curette not originated. Pathology was in its infancy, and the ravages of the micro-organism were unknown. Now, in the march of time, the laws of infection are better known, the action of the gonococcus and streptococci studied, and we are taught that much that passes under the name of endometritis is not an inflammation at all, but an alteration in the glands, such as new growths, atrophy and cystic degeneration. If this is so, why continue the use of the term; cannot some of the pathologists invent a word to use to define the meaning of these passive congestive conditions of the endometrium? I have not been able to find that pathologists have written anything in favor or against this theory, assuming that the term is used properly.

I was compelled to investigate this subject, partly for the purpose of a paper to-night, and to be instructed on this matter from the fact that in making out the yearly hospital statistics for 1898, I found on the records that the staff had diagnosed endometritis in a very large percentage of the gynæcological cases. As the treatment curettage followed in almost every case, I wondered if, after all, we did not use the term on the principle that if we were going to remove the mucosa by operation, the disease ought to be present. I do not wish to criticize the treatment, only if the diagnosis has been fungoids or adherent decidua, menorrhagia, metritis or malposition of some form, the value of the statistics would have been increased.

While writing this paper it occurred to me that I would ask my friend, Professor Welch, of the Johns Hopkins University, to give his views on the pathology of the subject. I was made happy to learn that they had been obtained and published by Dr. J. D. Emmett, editor of the *American Gynæcological and Obstetrical Journal*, in a most interesting paper, entitled, "Curetting and Packing the Uterus," and found in the May volume, 1897. Dr. Emmett writes: "On the subject of endometritis, the pathologists are strangely silent. They have either tacitly permitted the assumption by the gynæcologist that all plevic inflammatory diseases had the uterus for its origin, merely because simple endometritis does occur, or the subject has been ignored entirely by these experts in regard to its true position in gynæcological pathology."

"It must be of great interest to hear the dicta upon this subject of one of the world's greatest pathologists. Some two years ago I wrote Professor Welch, of the Johns Hopkins University, asking him to give me answers to certain propositions in regard to endometritis. At that time I was exceedingly doubtful as to the existence of simple endometritis, *i. e.*, as an independent and primary affection not traceable to direct extension from the vagina of septic inflammation. Dr. Welch's statement to the effect that this simple form of the disease may and does occur, was, of course, accepted by me as final." Note now, particularly, Professor Welch's statement. He says: "Doubtless, symptoms which are often attributed to endometritis are in reality due to other lesions, such as affections of the uterine wall outside of the mucous membrane and of the peritoneal covering of the uterus and adjacent parts and affections of the uterine adnexa and disturbances of the circulation, such as you enumerate. Uterine enlargement and periuterine tenderness would seem to indicate something more than, or different from, an uncomplicated or simple endometritis.

"A leucorrhœal discharge, if really derived from the cavity of the body of the uterus, and if containing, as is customary, pus cells, would certainly indicate general inflammation of the uterine mucosa; in other words, an endometritis. I do not, however, understand that a leucorrhœal discharge has always this source, so that its presence does not of necessity indicate endometritis. The term leucorrhœa is, in my opinion, somewhat indefinite, and may be applied to discharges of different compositions and of different origin. A leucorrhœal discharge may be very rich in pus cells, be genuinely purulent, or it may contain comparatively few pus cells. The quantity of mucus, red blood corpuscles and epithelial cells present in its varieties, within wide limits, and especially the number and kinds of bacteria present, vary. A leucorrhœal discharge is indicative of inflammation of some part of the genital tract between the tubes and the vaginal outlet, but the exact seat thereof varies in different cases. It may be due to several causes, chiefly pathogenic micro-organisms, of which the best studied are the gonococcus and streptococcus.

"I have no doubt that disturbances in the endometrium induced by changes in the uterus itself, or secondary to lesions external to the uterus, favor the lodgment and growth of these pathogenic micro-organisms. I should consider it an important matter to make clear the influence of these various accessory causes seated outside of the

uterus in predisposing the endometrium to inflammation by the invasion of micro-organisms, which might do no harm at all, were it not for the underlying disturbances. Passive congestion or stasis of the blood are doubtless among these accessory underlying causes, but there are others.

"Much can be said in favor of the view that inflammation is a weapon used by nature to combat micro-organisms. While recognizing, therefore, that there is much truth in your views, that leucorrhœa, while itself a sign of superficial inflammation of some part of the genital mucous membrane, is often dependent for its existence and persistence upon causes more deeply seated, and often outside of the uterus, I should not be willing to bring all cases under this category. Some are, doubtless, simple and uncomplicated inflammations of the mucosa of the uterus; that is, genuine endometritis. This is true, not only of puerperal and gonorrhœal cases, but of some other cases which I have examined microscopically. While I have seen cases of genuine inflammation which can be called nothing else but endometritis, it is true that much which passes under the name of endometritis is not an inflammation at all in the ordinary acceptance of the term 'inflammation.'

"Many cases of the so-called endometritis are characterized chiefly by non-inflammatory alterations of the glands, atrophy of the glands, cystic dilatations, etc. These glandular alterations may be accompanied by non-inflammatory lesions of the stroma, such as hyperplasia, formations of lymphatic tissue, fibroid transformation, etc., or there may be very little change in the stroma. Such alterations many good pathologists refuse to regard as inflammatory."

Now, if the pathologists tell us that it is true that much which passes under the name of endometritis is not an inflammation—what is it? What shall we call a disturbance of the lining membrane of the uterus so mild that there is no inflammation, but present a leucorrhœal discharge, with or without micro-organisms? Will catarrh cover it, or uterine irritation, which might be due to the bacteria said to be always present in the vaginal secretions, or congestion? If this form of trouble, call it what you choose, continues, the vitality of the membrane is lowered, and a condition exists well calculated to support germ life, and this congestion would soon change to an endometritis. At this stage of the disease our line of treatment must be drawn. In such cases hot douches are sufficient, and in the writer's opinion the mucosa *should not be removed*, but the endometrium should be allowed drainage, and mildly styptic pressure

by packing the canal, if the lining membrane is hypertrophied, or stimulated by properly applied local medicaments, if atrophied; some form that will produce absorption of the effusion, contract the vessels, and restore the tissues to their normal functions, and the best of these are carbolic acid, carbolic acid with iodine, solutions of permanganate of potash and ichthyol. The proper application of these drugs acts as alteratives, astringents, antiseptics or caustics, according to strength used and result required. Just how they act I cannot state, but I am willing to go on record as an advocate of their careful use in the treatment of these milder forms of congestive endometrial disorders. In the Woman's Hospital in 1894, where curettage was the operation performed in one hundred and fourteen cases, endometritis was the diagnosis in only twenty-four cases, and the operation was for this disease alone, only six times.

I write this because that at the present time every case, as I have proved, is not endometritis, and if this assertion is logically true, then, the treatment, now the routine one of curettage, is not indicated. However, this is debatable ground, and has strong advocates, men who would never do a plastic operation on the cervix without first depriving the entire canal of its mucous covering for fear of closing up some form of infection.

The curette has its place, but I am convinced that it is used much too frequently in these catarrhal conditions of the uterine cavity. The operation is not curative, it denudes the membrane of its epithelial cells, whose properties are to prevent inflammation, and in many cases it is bad practice, bad for the patient because it does not cure, and bad for the operator because he comes to think that all cases demand it, and because if not done aseptically, his patient will become impatient and find some other physician who can cure her without a two weeks' duration in bed.

Then we have another class of gynæcological teachers who believe that scraping away the endometrium just scatters the infection, and induces absorption more readily.

Not long ago I noticed in a discussion that H. W. Boldt, of New York city, had used the expression, "much abused operation," so I wrote him asking him to give his reasons for the quotation. I quote his reply. "In reply to your favor I beg to say that the quotation from a discussion meant this—the operation of curetting was made very frequently without the indication being found for it. I see probably forty or fifty cases annually which have been subjected to it, and who had no lesion to demand it. In cervical tears it is indicated if the endome-

trium is inflamed, if no disease of the endometrium is present neither operation is indicated. In suppurative disease of the adnexa it is a very dangerous procedure."

As a résumé then of the paper, I want to make emphatic my belief.

First: That simple endometritis, uncomplicated, is rare; that a leucorrhœa when present is not indicative of it, without the presence of micro-organisms, which would argue that all scrapings should be microscopically examined for correct diagnosis.

Second: That gland tissue disturbances of the endometrium whether from congestion or lack of blood supply is not, according to Professor Welch, an inflammation, and, therefore, not an endometritis, in the true definition of the term.

Third: Such disturbances are better, and more scientifically treated from the medical than from the surgical standpoint.

Fourth: That the curette, a powerful factor in the treatment in some forms of endometritis, is not curative in this form, and is, according to good authority, used much too frequently without due reason, and often by the irregular, with criminal intent.

"THE DOUBLE MICROSCOPE" REVIEWED.

By M. C. WHITE, M.D.

Professor of Pathology, Yale Medical School, New Haven.

I have been asked to give my opinion on the article by Elmer Gates, in the November number of the *American Monthly Microscopical Journal*, on the "Double Microscope;" *i. e.*, two microscopes arranged *en tandem*. He proposes to make photo micrographs, taking, for example, an ordinary microscope illuminated by the electric light, using a $\frac{1}{4}$ objective with an ordinary eyepiece, and after carefully focusing the object remove the eye lens of the microscope and arrange another microscope in the same axial line, using, say, a 1 inch or $\frac{1}{2}$ inch objective and a proper eyepiece, and focusing the second microscope on the image formed at the diaphragm in the first microscope; then placing the bellows and ground glass screen of a camera beyond the second microscope to receive on the screen the image formed by the above described double microscope, so altering the focus as to give a sharp image on the screen. A difficult and delicate adjustment, but one, which, of course, can be accomplished. A photograph is then to be taken in the ordinary way, by placing a sensitive plate for a proper time in place of the screen. This arrangement opens up the real question to be discussed, and we need not at present consider the possibility of using objectives of high power, or simpler lenses constructed for monochromatic light, or lenses made of quartz, or light from a heliostat, with a mirror of 12 inches diameter.

Now, practically speaking, this plan replaces the single eye lens of the first microscope by an objective and a compound eyepiece, acting as an eye lens to the first microscope; to form, not an image on the eye, or on the screen, as the first microscope did, but taking the real image in the diaphragm of the first eyepiece to form a second image, and then on the screen another image of the second image, that is, a third image of the real object on the stage of the microscope. This the author claims will give sharper definition, more detail, greater depth of view and a larger field.

Some of these points are open to tests by experiment, and in this we wish the inventor all possible success. We know

that two lenses of low curvature will give a better image, with less spherical aberration, than any single lens of deep curvature.

Again, our modern opticians have made microscopic objectives so nearly perfect that but little advance can be hoped for, except on possibly some new departure; but the construction of more perfect eyepieces has received less attention, and in my opinion the eyepiece of the microscope presents a promising field for improvements and new discoveries. I am not quite certain that two microscopes *en tandem* may not obviate some of the defects of our present eyepiece, yet *I seriously doubt* if any plan to form a second image between the first real image and the screen of the camera can give any advantage in the way of improved definition.

Let us look, then, at the question of penetrating power, *i. e.*, depth of view obtainable on the *tandem* plan.

It is well known (see "Carpenter on the Microscope") that it can be proved mathematically that when an object is magnified in breadth it is also made to appear thicker or deeper, and that the apparent depth or longitudinal magnification bears a certain relation to the apparent breadth. With the microscope one cannot see through a thick object; therefore, all transparent objects seen in the microscope must be very thin to enable one to see their structure.

Let x represent the lateral magnification, and let y represent the magnification in depth. Then if we let dx represent increase of lateral magnification and dy the increment of increased apparent depth we shall have $dy=dx^2$. The increment of depth is equal to the square of the increment of breadth. That is, y or the apparent depth or thickness of the object is a rapidly increasing function of x or the lateral magnification. This proposition is equally true whether the magnification is obtained by a single lens, or by a system of two or more lenses, or by two microscopes arranged *en tandem*; hence I reject the proposition that greater depth of the object can be seen with two microscopes than with one. Yet it will look deeper, but less of the thickness can be clearly seen. We may safely challenge experiment on this question.

The next, and really the most important question, is, "Can sharper definition and more detail be brought out by two microscopes arranged *en tandem* than can be shown by a single microscope?"

The best mathematical opticians hold that no details can be made visible to the eye or defined on the sensitive plate that

are smaller than one-half the length of a vibration of the kind of light used. Markings 100,000 or possibly 200,000 to the inch appear to be the limit of vision by any optical instrument yet known. Could we use light in a medium allowing vibrations of only 1-1,000,000 of an inch, our limit of vision could be extended.

If the inventor of the double microscope can reject all visible rays, and utilize the invisible rays, then, theoretically, he may investigate finer details than any one has yet seen.

Now by what means does Mr. Gates propose to advance microscopic investigation? Why, in the second place, he proposes to use monochromatic light; and thus simplify the construction of objectives. This might (?) be one point gained; but what about spherical aberrations? The correction of spherical aberration and spherical curvature of the image is about as complicated as the correction of chromatic aberration. Wide angular aperture of objectives could not possibly be abandoned, and this requires lenses of the most complicated construction. These two considerations forbid the hope of simplifying to any considerable extent our present objectives.

How about obtaining monochromatic light? The author of the article under review proposes to employ large prisms, taking light of a single color, and to concentrate it by lenses made of quartz. Now no two points of the spectrum formed by a prism have the same index of refraction, and we should still have prismatic dispersion in the so-called monochromatic light.

Still more. If this so-called monochromatic light is concentrated, as the author proposes, by lenses made of quartz, we should have double refraction in the borders of the lenses, even if the lenses were cut at right angles with the principal axes of the quartz crystal.

Now leaving the double microscopes of low power, $\frac{1}{4}$ and $\frac{1}{8}$ inch objective, take a $\frac{1}{16}$ with a $\frac{1}{4}$ or $\frac{1}{8}$ following it in the second microscope, how is sufficient illumination to be procured? The author says he has obtained a heliostat with a mirror 12 inches in diameter. This beam of sunlight 12 inches in diameter, he expects to reduce to a beam one hundred times less in diameter and to send that reduced beam through the microscope. This would give light 10,000 times more intense than ordinary sunlight (hot enough to melt platinum!!!) Can any lens exist transmitting such a concentrated beam of sunlight? Where is the balsam cemented lens or the balsam mounted object that can stand that enormous heat? But I suppose the author ex-

pects to filter out the heat rays by passing the light through an alum cell. No one who has used the electric light for an hour continuously with the projection microscope, even with an alum cell to filter out the heat rays, will have any doubt that balsam mounted objects and the objectives of the microscope are heated up very near the point of danger.

I need not discuss the question of making photomicrographs of tissues inside the body by microscopes *en tandem* illuminated with invisible rays of the spectrum.

I omit also the discussion of diffraction as an obstacle to photographing minute details hitherto unseen, though that subject does not appear to have been considered by the author.

Wishing him all possible success in his experimental work, I subscribe myself a believer in great improvements in the microscope in the near future.

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ACCORDING to the provisions of a bill passed by the Legislature of two years ago, Governor Cooke appointed a Sewage Commission to "investigate the subject of sewage disposal of the cities, boroughs and towns of Connecticut," and to "formulate a report and submit the same to the General Assembly." This report is at hand and is a printed document of about ninety pages. It contains a list of the cities, boroughs and towns having water supplies and sewerage systems; some references to the Danbury and New Britain sewage litigation; reports by Mr. Rudolph Hering and Mr. Samuel M. Gray on the problems of sewage disposal at Waterbury and New Britain; a brief account of the sewage beds at Meriden; and certain conclusions and recommendations. About one-quarter of the report is devoted to these matters, the remainder being chiefly a description of the nature of sewage, its composition and effects when discharged into waterways, and the methods which have been devised for its disposal; in brief, an elementary treatise on sewage and its disposal. Without discussion of the necessity of a special commission in this State to make a study of the literature and sewage works in operation, we may at once say

that it is difficult to see how the commissioners could have done more than they have accomplished with the powers conferred on them, and we may congratulate them on the happy form of their report. The opinions which they express in their conclusions must meet the approval of all who have carefully studied the problem of sewage disposal in this State. These are in part, that there should be certain broad restrictive legislation, and that there should be some competent State authority, operating on the basis of this legislation, to whom all plans of contemplated sewage disposal works should be submitted, and without whose approval no such plans should be legally carried into effect. With such control it would be possible to avoid the expensive mistakes which our towns are likely to make through incompetent or interested advice, and to protect the interests of other towns in the same region. That there should be some authority to hold the towns to a proper operation of disposal works after they have been properly constructed is most obvious to those who have critically watched the development of the works already established in this State. Whether such duties be given to a special commission or assigned to the State Board of Health, as has been done in Massachusetts and some other States, along with a similar control of water supplies, is a question of how it may be best and most economically done. It would seem in as small a State as ours, where the work of such a commission will be limited by a comparatively small number of sewage systems, that it will be found both better and more economical to assign this work to the Board of Health than to sustain a permanent commission for this purpose. The permanent organization of the Board and its facilities for making investigations without largely increased cost are the main factors which may be expected to bring about this result. One board could as easily avail itself of the best sanitary engineering advice as the other.

* * *

THE third lecture in the Yale Medical Alumni Association course, official notice of which appears in another column, will be delivered by Dr. Maurice H. Richardson, Associate Professor of Clinical Surgery at Harvard University. His subject, "Inflammation of the Gall Bladder," is one which at present is of great interest, and upon which Dr. Richardson is especially qualified to speak, for he has done more on surgery of the gall bladder than any other surgeon in the country. It will be remembered that Dr. Richardson is one of the two American

surgeons who have successfully performed the operation of extirpation of the stomach. His patient, an elderly woman, is still living and in comparatively good health. The Alumni Association is to be congratulated upon procuring so eminent a speaker upon this important subject.

* * *

EXTENSIVE scientific investigations have been instigated by the occurrence of the fever epidemics in our army during the late war, and by the denunciation of the different departments by each other. So that it seems probable, as some one has remarked, that the war will shortly be the means of saving more lives than it has cost, by the discovery of better methods for preventing the spread of such diseases. In another column we publish a brief résumé of an article by Dr. Veeder on the spreading of intestinal diseases by flies. While it was written with especial reference to the hygiene of camps, there is no reason why the simple precautions recommended cannot be observed more readily by the physician in private practice than by the army surgeon. Such prophylactic measures would often serve to check what might otherwise be a severe epidemic. The greatest difficulty lies in making those who care for the sick understand that such precautions, so often considered unnecessary, are of the utmost importance. The article impresses upon the physician the necessity of using great care in seeing that his directions, in regard to the sterilization of water and the disinfection of feces, are fulfilled.

MEDICAL SOCIETY REPORTS.

THE NEW HAVEN MEDICAL ASSOCIATION held its regular meeting January 18, 1899, President Wright occupying the chair. There were present as guests Drs. Ryle, Hinkley, and Oertel. Dr. Foote was appointed secretary pro tem.

Dr. Eliot reported the following case: An English woman, 53 years of age, was pregnant six times. Her first pregnancy was terminated by instrumental delivery, the head presenting. The second pregnancy resulted in a cross birth, requiring perforation. The instrument slipped during the operation and produced a vesico-vaginal fistula. In the third pregnancy she was delivered of a six-months' child, the placenta being adherent. The fourth pregnancy resulted in the birth of a seven-months' child, with adherent placenta. The fifth pregnancy terminated

in miscarriage at three months, again with an adherent placenta. She was then curetted, and in her sixth pregnancy carried the child to full time, but the child was still-born, and the placenta adherent. It was of interest to note in this case that little discomfort resulted from the vesico-vaginal fistula, except during pregnancy.

Dr. Bacon related the case of a robust man 54 years old, who, with no preceding injury, developed a large swelling in the chest. This had been freely incised, exposing a necrotic rib. There was marked sepsis, and a temperature ranging around 103°. Pyaemia did not develop. The skin about the wound looked healthy. Small spicules of bone came away from time to time, and moderate amounts of pus. When seen a week later, the patient was much worse. There had been a steady, moderate flow of pus, and the temperature remained about the same. But his appetite and digestion were much poorer, and there was some delirium. A considerable portion of the rib was removed, piecemeal. The patient died a week later, without secondary abscess. All the viscera were in good condition, except a slight consolidation in left lung. The patient apparently died of asthenia.

Dr. C. S. White related the case of a man, who, unable on account of head symptoms to take any quinine, was cured of a bad attack of malarial fever by the administration of guaiacuin carbonate, five grains, t. i. d.

Dr. Phelps reported the following family history: The patient, Mrs. M. H., gave birth to twins twice. There was no history of twins in her family, but her husband's maternal grandmother was twice delivered of twins. His mother had thirteen children, including one twin pregnancy. Three of his sisters married, and one had twelve children, including one pair of twins. Another sister had eight children, including one pair of twins. The third sister who married had eight children. The brothers who married were very prolific, but had no twins. There were, then, in three generations of this family, seven twin pregnancies.

Dr. Carmalt reported the case of a woman, aged 75 years, who had been confined to her bed for a week, suffering from abdominal pain and constipation, which latter had been partly relieved by enemata. Her previous history was good. The abdomen was swollen, tympanitic, and tender. There was an indefinite dullness and resistance to pressure in the right iliac region as far up as the gall bladder. She vomited continuously, but the vomitus was not fæcal. A provisional diagnosis of

intussusception was made, but on account of age and a weakened condition of the heart, no operation was advised. Three or four days later a large quantity of blood, with some membrane, came away per rectum, and she began to improve. There was a movement of the bowels, the dullness cleared up, and the patient recovered.

Next followed the reading of the paper of the evening, entitled, "The Detection of Foreign Bodies within the Eyeball," by Dr. Swain. The paper was discussed by Drs. Carmalt, Alling, McCabe, Bacon and Sprenger. The meeting then adjourned.

The regular meeting of the New Haven Medical Association was held on Wednesday evening, February 1, 1899. In the absence of the President, Vice President Alling occupied the chair.

Dr. Mailhouse related a case illustrating the value of the pupillary reaction in the diagnosis of syphilis. The patient, a woman, had peripheral neuritis of both legs from the knee down. The right pupil was larger than left and both failed to react to light or accommodation, which symptoms were not due to local causes or general paresis. In spite of the denial of a specific history a diagnosis of syphilis was made, and this was later confirmed by a characteristic history elicited from the patient, which she had denied at the previous visit in the presence of friends. This condition of the pupils, when not due to local causes, is considered diagnostic of syphilis. The case was discussed by Drs. F. Bacon and Alling.

Dr. Russell related the case of a German woman first seen one year ago. She was 48 years old, stout, and had passed the menopause eight months previously. She had had eight children and two miscarriages. She complained chiefly of intense pain over the sacrum, of bearing down sensations and of frequent micturition. Examination revealed a uterus protruding from the vulva for one-third or one-half of its length. There was also rectocele and cystocele, an extensive laceration of the cervix and endometritis. A uterine sound entered the uterine canal to the depth of $3\frac{1}{4}$ inches. Curettage was done, followed by trachelorrhaphy and anterior colporrhaphy by the Stolz method. Four weeks later hysterorrhaphy was performed. An incision of $3\frac{1}{2}$ inches was made on account of thickness of the abdominal walls. The uterus was replaced with difficulty and secured to the abdominal wall by two silk worm gut sutures. The wound was closed with silk worm gut. Then posterior colporrhaphy was done. The sutures were left in twenty days.

The patient made an uneventful recovery, obtaining complete relief from her symptoms. Upon examination, nine months later, the abdominal wound was found to be firmly cicatrized. The uterus was somewhat higher than normal and slightly movable. There was neither cystocele nor rectocele. The patient expressed herself as completely relieved from all disagreeable symptoms.

Dr. Swain related two cases, seen in one week, of sarcoma of the nose, necessitating an external incision for their removal. He said that sarcoma of the nose was of comparatively rare occurrence. The first was in a man of fifty years of age, and the growth was of such a character that its complete removal appeared accomplished. The wound healed by first intention, and the prognosis seemed good. The second case was a young Armenian girl, where the sarcoma involved the palate and septum as well as the other nostril. The tumors were both small, round celled sarcomata, and both began in the region of the antrum.

Dr. Alling related the case of a man who, while working in a mill two months ago, was struck in the eye by a bit of hot metal. The wound was thought to be trivial, but it grew worse, and first came under his notice about a week after the accident. At that time examination showed a wound in the cornea, in the iris near the pupil, and also a traumatic cataract. A large Hobb magnet was used, causing no pain, but with negative results. The eye then began to improve up to about two weeks ago, when the iris became congested, and the eye inflamed. Last week the eye was removed because it was painful, absolutely without vision and was getting worse. A small piece of iron was found imbedded in the retina, and around it atrophy had begun. Effused blood could be seen over the ciliary processes, with beginning bands of newly-formed tissue. The lens was cataractous. The eye, which was shown to the Society, exhibited these points very plainly.

Dr. Townsend then read the paper of the evening, this being the annual address, which he, as President, was unable to deliver at the Annual Meeting. The subject of the paper was "The Modern Sanitary Soldier." The paper was discussed by Drs. Bacon, Springer and Arnold.

The following set of resolutions, offered by Dr. F. Bacon, were unanimously adopted, and the Secretary was instructed to send copies to the two Senators and four Congressmen from Connecticut:

"WHEREAS, In the plans for the reorganization of the Army, now under consideration in the Congress of the United States, the apportionment of rank among officers of the higher grades in the Medical Corps is less liberal than in other staff corps, and apparently lacks just consideration for the important duties and great responsibilities devolving upon the Medical Corps; therefore, with the hope of promoting the highest efficiency of the Medical Corps and the best interests of the whole army,

Be it *resolved* by The New Haven Medical Association, that the attention of the Senators and Representatives from Connecticut be respectfully invited to the memorial of a committee of medical officers of the army issued from the Surgeon-General's office, January 14, 1899, and embodying in the opinion of this Association a fair and equitable proposal for the determination of a question of high importance."

It was voted that the Association accept Dr. Arnold's invitation to meet at his home on March 1, to listen to his paper on Scoliosis and its treatment.

A regular meeting of the New Haven Medical Association was held Wednesday evening, February 15. The President, Dr. F. W. Wright, presided.

Dr. E. L. Kingman, who is here on his vacation from South America, was introduced, and gave the society a treat by exhibiting two remarkable specimens, one the head of an Indian, the other that of a half-breed. These heads are prepared by a tribe of Indians inhabiting certain sections of Brazil, Ecuador and Peru, and who are in an entirely uncivilized state. By the process they employ, the bones are gotten rid of and the heads are greatly reduced in size, but they still retain their characteristic features. The method which they make use of in the preparation of these heads is not known. The subject was discussed by Dr. Ely, who suggested that they might be cured by nitric acid or some similar acid. Dr. Kingman, speaking of the practice of medicine in South America, stated that malaria was very prevalent in all forms, and that leprosy was not uncommon.

Dr. Mailhouse related a case of status epilepticus. The previous history is as follows: When the patient, a woman, was 12 years of age, the first attacks of epilepsy appeared. There was no family history of epilepsy, and the cause was unknown. The attacks came on at night, and the patient would become livid and unconscious. In 1891 she remained unconscious for two days following an attack. Since that time she has had at-

tacks at frequent intervals, and during the past year they became more severe and frequent. Treatment was mixed bromides and cod-liver oil. When Dr. Mailhouse first saw the patient about a week ago, she had just come out of an attack. On the following night she had thirty-two convulsions, the greatest number he has ever known to occur in that period of time. The attacks were typical; they started on the right side and then generalized. The patient always remained in a comatose state between the convulsions. They were stopped by a thirty-grain dose of chloral—given as an enema, only one convulsion occurring after its administration. The patient remained in a stupor, however, for several days. The case was discussed by Drs. Oertel and Verdi.

Dr. Arnold reported a case of a lady who fell and received a slight injury on the anterior surface of the leg below the patella. The wound at the time was thought to be trivial, but it grew worse and came under his notice several days later. Examination revealed two small ulcers with considerable loss of tissue and having well defined borders surrounded by an area of redness and induration. There were no cuts or bruises and no varicose veins or other ulcers on the leg. The slight injury could not account for the present condition, which suggested a specific disease. This was thought improbable, however, and the patient was not questioned on that point. After treating the case for eight to ten days it was learned that the woman had used collodium, obtained from a druggist, on the wound shortly after falling. The bottle labeled "Cantharides Collodium" cleared up the history.

Dr. Verdi reported the following case: A woman, 65 years old, occupation a nurse, had had three children. The present trouble began three years ago with severe pain in the right loin radiating down toward the bladder. The diagnosis of renal colic was made. Some time later the woman passed several calculi and a quantity of blood, which was repeated a few months later. She has had a temperature for the last two years. Two weeks ago she became much worse and Dr. Sheehan was called in. The woman was suffering the most intense pain, but the general health appeared good. A week later she had a chill and passed the most foul smelling, turbid urine for the next few days, when it cleared up again. Examination revealed a small tumor about the size of a grape fruit and of elastic consistence. Last week Dr. Verdi was called in and the diagnosis of pyonephrosis (with calculi) was made. Nephrectomy was performed through a lumbar incision. The

operation was successful and bore out the diagnosis. The kidney was shown to the society. It contained several cavities and calculi and there was scarcely any normal kidney tissue remaining. Dr. Verdi stated that the patient was doing well, passing about 600 c. c. of normal urine.

The Question Committee reported that the next meeting would be held at the home of Dr. Arnold, when the society would listen to his paper on "Scoliosis and Treatment."

MEDICAL PROGRESS.

THE ROLE OF THE SPLEEN IN INFECTIONS.—(*Journal of Am. Med. Assn.*, Feb. 11.) Experimenters find that the spleen does not play the same role in all infections. Sometimes it seemed to be useful, at other times even harmful, according to the nature of the infectious agent. Its action upon the toxins of the microbe may differ from that upon the microbe itself, and the same animal may react differently to infection soon after removal of the spleen than later. These apparently so contradictory results are explainable, perhaps, by the condition of the fluids of the body, and the modifications that result in the fluids after removal of the organ. Extirpation does not seem to harm the animal. Animals without spleens seem to bear infection from diphtheria and anthrax quite as well as normal animals, and even react better to pyocyaneus infection and the cholera bacteria. One of the striking changes in the blood after splenectomy is an increase in the number of leucocytes, especially the lymphocytes. This leucocytosis is not explainable as due to the operation wound only, because no such leucocytosis developed in guinea pigs in which the same wound was made but the spleen not removed. Ligation of the splenic vessels has the same effect as extirpation. It seems probable that the leucocytosis and the increased bactericidal power of the blood stand in close causal relation. As a proof of this fourteen animals were inoculated with the bacillus pyocyaneus, a few hours after the spleens were removed from eight. Of the eight, six died, and of the six which retained their spleen, only two died. These results are the opposite of those observed when the infection takes place after splenectomy and show the importance of the hyperleucocytosis and other changes after splenic removal. An explanation of the increased resistance of the blood of splenectomized animals is that the spleen during health retains the detritus of

disintegrated leucocytes and other cells, this leucocytic detritus is regarded as being closely related to the alexines, and after splenectomy it would accumulate in the blood and increase its bactericidal powers. Taking it for granted that the leucocytosis after splenectomy influences infections in the same favorable way as increase in the polynuclear leucocytes does, then we have strong indications that the splenic lymphocytes produce alexine, and that the splenic tumor of infectious diseases, which depends largely upon increase of the leucocytes in the spleen, may play a similar role in the increase in the polynuclear leucocytes in many infectious diseases without splenic swelling. It is a well-known fact that in typhoid fever and uncomplicated tuberculosis a very marked swelling may develop with no increase in polynuclear leucocytes. In pneumonia, polynuclear leucocytes develop up to the time of crisis, while the spleen remains small, but after the crisis the spleen begins to swell and the leucocytes diminish. Authorities are disposed to emphasize this regular alternation of splenic swelling and polynuclear leucocytosis, and to look upon these phenomena as of a similar nature and significance. At one time the lymphocytes are increased, at another, the polynuclear leucocytes. It is in accordance with generally accepted views to assume that the different microbes influence, through chemotaxis, now one, now another variety of cells. The spleen would, therefore, seem to play an important part in infectious diseases because it is the origin of the lymphocytes.

THE RELATIVE IMPORTANCE OF FLIES AND WATER SUPPLY IN SPREADING DISEASE.—(*Engineering News*, Dec., 1898.) At a recent meeting of the Buffalo Sanitary Club (Dec. 14, 1898), devoted to the discussion of camp hygiene, Dr. M. A. Veeder, of Lyons, N. Y., read a paper on the Relative Importance of Flies and Water Supply in Spreading Disease. The larger part of the paper is devoted to the discussion of the spread of disease by flies. Diseases that may be spread by flies or water, under different circumstances, are intestinal and malarial, and include typhoid fever, yellow fever, Asiatic cholera, certain forms of dysentery, and, perhaps, malarial fever and malarial poisoning in general. In the intestinal diseases the infection is a bacillus which has come from the excretions of a diseased bowel. The malarial diseases have as sources of infection the plasmodium, which lives especially in marshy soil or stagnant pools, and is independent of contamination from human sources. It has been shown, contrary to previous ideas, that in camps and in other

places where circumstances are similar, intestinal diseases are usually spread by flies and malarial by water. During the campaign in Cuba the prevention of intestinal diseases was attempted by having the purest water supply, but it failed. The same thing was true in the British campaign at Fashoda, in a most hygienic climate and carefully planned campaign. There are often little neighborhood epidemics, where there is no common water supply, which can be traced to flies. Recently one of these epidemics, in which there were forty cases and ten deaths, was stopped in a single day by measures directed against flies. There is no longer any doubt that these diseases are spread by flies. The prevention of such spreading can be absolutely certain and depends on two things only—immediate and complete disinfection of the faecal matter. Immediate disinfection is necessary, for it is taking serious chances to allow even a single fly to crawl over the matter. For disinfection some agent should be used that will kill every bacillus. Burying typhoid material is no protection against flies, it simply establishes a culture bed where the bacilli, like plants, grow to the surface under the effects of the sun and warmth. Besides this burying actually perpetuates the disease from year to year. Disinfection is absolutely necessary therefore. If any volatile disinfectant, like carbolic acid, is used, it must be used in large quantities, as it soon evaporates, leaving nothing behind. Copper sulphate in solution is an excellent disinfectant, for, diffused through the whole mass, its effect is prolonged and even made permanent if a sufficient quantity has been used. The prevention of conveyance of intestinal diseases by water is absolutely certain if the water is boiled. In respect to the prevention of malarial diseases in this way, the writer believes that it is well nigh absolute. Still there is some danger of the conveyance of malarial parasites by mosquitoes and perhaps by flies. Against infection from this source the only guard, of course, is quinine.

A NEW METHOD OF PREPARING SILK LIGATURES.—Dr. F. A. Scherrer (*Philadelphia Medical Journal*) describes the following method of making silk ligatures. The silk is first wound about a microscope-slide, so as to present the greatest possible surface, and boiled for five minutes in a dilute solution of sodium bicarbonate to remove all fatty and resinous material. It is then washed in running water for half an hour to remove all soda. He next boils it for five minutes in a strong solution of silver nitrate, and then drops it in a dilute *boiling* solution of sodium bicarbonate, allowing it to remain in same for five min-

utes. The sodium bicarbonate precipitates metallic silver upon the silk which colors it a deep brown. The silk is now washed for half an hour in running water and then dried. The sterilization is then effected by boiling. The process is said not to rot the silk and it will be found as strong after the process as before. A strand of this silk placed in a culture of colon-bacilli was found to retard their growth for an area of $\frac{1}{8}$ inch from the silk, while farther away they grew luxuriantly. It has been used by Dr. G. M. Boyd, of the Philadelphia Lying-in Charity Hospital, in two cases of oöphorectomy both in tying off the pedicles and in suturing the abdominal wall. He has reported favorably, saying, "the silk was all that could be desired." Dr. Scherrer has used it in one herniotomy and six circumcisions. The sutures showed no signs of sloughing, nor of pus, nor did they cause any pain or reaction. These results are attributed to the ease of sterilization and the silver contained in the silk. The process is cheap and simple and he requests the profession to give it a trial.

THE EFFICACY OF GUAIACOL IN THE TREATMENT OF EPIDIDYMITIS.—In an article on this subject in the *Medical Record*, Jan. 7, 1899, Dr. J. Clifford Perry says that in the treatment of epididymitis the essential feature is to employ that agent which will promptly relieve the pain, hasten the absorption of the inflammatory exudation, and which will enable the patient to resume his business with as little loss of time as possible. By the use of guaiacol the symptoms are more speedily relieved and the course of the disease rendered much shorter than by the use of lead or opium solutions, tobacco poultices or any of the usual remedies. Applied locally as follows: 1 c. c. of pure guaiacol is painted over the cord of the affected side as it lies in the inguinal canal, and 2 c. c. of a solution of one part of guaiacol in two parts of glycerine is painted on the scrotum over the diseased epididymis. This drug gives complete relief from pain in from twenty to thirty minutes. This is not permanent, however, the pain returning in from six to eight hours, and, though much lessened in intensity, necessitates another application. The patient is thus enabled "to secure refreshing sleep and the fibrile disturbances subside as the temperature is at once reduced by the antipyretic action of the drug. The swelling rapidly diminishes, being reduced one-half by the end of the second day, and by the end of the fifth day it has entirely disappeared. The exudate is also rapidly absorbed, thus rendering less liable the formation of nodular masses in the epididymis.

In all the acute cases, whether traumatic or gonorrhœal in origin, the analgesic and antipyretic effects of the drug were markedly apparent. In subacute cases, however, it appeared to have less effect and in chronic cases was of no apparent value. Auxiliary remedial measures were the administration of mild laxatives and suspending the testicle in a Horand-Langlebert bandage. "But," said Dr. Perry in conclusion "for the prompt cure of epididymitis I wish to emphasize the fact that guaiacol is the most valuable remedy we possess."

HOSPITAL AND CLINIC NOTES.

A CASE OF TRAUMATIC JACKSONIAN EPILEPSY, WITH COMPLETE RECOVERY.—While leaning from the running board of a trolley car on August 1, W. M., a laborer, 35 years old, was struck on the head by a telegraph pole and rendered unconscious.

He was admitted to the New Haven Hospital, and on examination by Dr. W. W. Hawkes, attending surgeon, was found still unconscious, but the reflexes were normal. There was a tumor over the whole of the right parietal region and an abrasion over the malar bone. From the right ear there was oozing of blood and a slight extravasation of grey matter. His temperature was 102.8°, pulse 104, and respiration 33. The diagnosis was fracture of the parietal bone.

In a few hours consciousness partly returned—the patient could be aroused by questions and recognized his wife, but was unable to speak.

Fourteen hours after admission slight muscular twitching was first noticed in the upper left eyelid. During this day there were spasms of both eyelids, and the left angle of the mouth was involved. The head began to gradually turn to the right. On the following day the left forefinger and thumb and hand, in addition, were seats of spasms. Then the arm and leg were attacked, and within forty-eight hours after the first appearance of the twitching the whole left side was involved. Just previous to the onset of the spasms the pupils were both equally dilated, and as the spasm passed they contracted again. These now came with great severity and frequency—every fifteen to thirty minutes, and lasting from one to two minutes. They began in the face, lasting a few seconds, then appeared on the hand, and when this ceased the face would again become involved. The leg participated but slightly in the convulsions.

As the eclampsia progressed the parts became paralyzed between the attacks. A marked effect was produced upon the heart by these convulsions.

After several consultations it was thought that the condition of the patient was such as not to warrant any hope from operative interference. However, the marked vitality of the patient and the increase in severity of the symptoms led to an operation by Dr. Hawkes—one week after injury. The patient's temperature was 103° , pulse 152, and respiration 39.

A modified Y shaped incision was made, with the crossed lines just over the hand center. A simple fracture was found running over the fissure of Rolando. There was a cross fracture running to the mastoid bone and through the base of the skull, as evinced by presence of grey matter, which was discharged from the ear.

A button of bone was removed over the hand centre, and a piece of bone $2\frac{1}{4}$ inches long and $\frac{3}{4}$ inches wide was gouged out up the line of the fissure. A large extra dural clot was found and removed. The dura had been ruptured, and there was an extravasation into the brain substance. There was a lack of brain matter for a space 1 inch deep, $1\frac{1}{2}$ inches wide and 2 inches long. This was caused entirely by the clot, for the slight depression of the bone could have caused no such compression. After removal the condition of the patient improved on the table.

The wound was stitched with interrupted silk sutures, hair drainage and dry dressing applied. There was no discharge, and healing was by first intention. The condition next day was worse, the convulsions being almost continuous. There was but little improvement noted for the first forty-eight hours. Then the convulsions gradually grew less severe, and ceased entirely on the third day—the order of cessation being leg, arm, hand and face. As the patient regained the use of his limbs it was noticed that he was unable to articulate, merely producing unintelligible sounds. This indicated that the patient was left-handed, the speech centre being on the right side, and hence involved in the lesion. This was afterwards found to be the case. Even after articulation returned there was word blindness.

By September there was a complete control of all functions, and the patient was discharged cured.

A CASE OF UNILOCULAR ECHINOCOCCUS CYST OF THE LIVER.—Of especial interest, taken in connection and comparison with the case of multilocular echinococcus, recorded on a previous

page, will be the history of a patient with a hydatid cyst of the liver, who was observed in New Haven about the same time.

An Italian barber, about 40 years old, who had been in this country for six years, was taken ill in June, 1898, with severe colicky pains in the right hypochondriac region directly over the gall bladder, after which he became slightly jaundiced. From this time he also dated a constant dull pain in the same region. He, however, paying slight attention to it, did not become alarmed until toward the end of July when he noticed a swelling in this location. The physician to whom he then applied for advice called Dr. Verdi in consultation. This was on August 15. He then appeared to be a man of good bone and muscular development, not emaciated, and with a moderate degree of jaundice. He was lying in bed, to which he had been confined for the last three weeks, in active posture. There was no œdema; appetite poor, bowels constipated, stools of brownish color. The pulse was full, regular, of normal tension, 65 per minute; temperature 98.4°. Inspection showed a pronounced prominence about the size and the general outline of a middle sized grape fruit, movable with respirations. It was located just below and a little to the right of the sternum. On palpation the skin was freely movable over it, a globular form could be distinctly felt as well as entire smoothness, and characteristic density with no pain on pressure. Fluctuation was uncertain. Going to the right the tumor was lost in the liver substance. Percussion was flat over the whole tumor area and increase in size of the liver could not be determined. There was no evidence of portal stagnation. The spleen was not enlarged; heart and lungs were sound. Urine was passed in normal quantity, containing bile pigment, but nothing else characteristic. The chief complaint at that time was the pain and the tumor. In making a diagnosis it had to be based upon the following facts: There was a large globular tumor, apparently of the liver, which had developed in a man about 40 years old within three months, and which so far had not caused any considerable interference with his economy. The conditions to be considered, and if possible to be excluded or confirmed, were diseases of the gall bladder, above all a hydrops cystis felleae, then the cystic degenerations of the liver, especially the echinococcus cyst. Other affections like benign or malignant tumors, as well as aneurysm or abscesses, were excluded after short consideration by the general appearance of the tumor as well as that of the patient and the course of the disease. The diagnosis then led to either a hydrops cystis felleae or a cyst of

the liver. Finally the most probable diagnosis seemed to be an echinococcus cyst, this idea being based upon the size, shape, density, peculiar elasticity of the tumor, and its relation to the liver, with due regard to the nationality of the patient and his general condition. To confirm this probable diagnosis aspiration was performed with the result of withdrawing a small amount of a clear yellow fluid, which unfortunately was lost. On second aspiration, however, no fluid was obtained, but on withdrawing the needle it was found to be filled with several pieces of a whitish gelatinous material, which were kept for examination. These small pieces had a characteristic porcelain-like appearance and a strong tendency to rolling in of their edges. They were quite soft. On microscopic examination they showed most beautifully the characteristic lamination of the echinococcus membrane, but no hooks or scolices. The only question remaining was whether the case was that of a unilocular, that is, hydatid, or a multilocular cyst. Of these the first was regarded as the most probable, because the characteristic of the multilocular form, a deep, hard, nodular, painful tumor with intense icterus, spleen-tumor and a more rapid course were absent. The diagnosis made certain, immediate operation was recommended but refused. The patient afterwards went to friends, then to a homœopath who sent him to a homœopathic institution in this city, where, according to later statements of the patient, he was freely painted with a substance (probably iodine) over the region of the tumor. He left this institution after a stay of three weeks and presented himself, very much worse, at the Dispensary, and later at the General Hospital, where he had been sent by Dr. Mariani of this city. There he was under the observation of Dr. Ely for a short time and the diagnosis of echinococcus unilocularis hepatitis was made once more. The patient then showed a marked degree of emaciation, no jaundice; the tumor reaching now 5 to 10 cm. below the umbilicus. Its character and especially the peculiar elasticity were much more prominent than at the first examination in August. There was also observed a moderate degree of leucocytosis. Urinary analysis showed 0.20% albumen. Respiration, temperature and pulse were normal. The heart was dislocated upward, the apex beat being 1.3 cm. above the nipple. The bowels were regular, and at the time of operation the stools were of normal color. The patient, however, stated that during the last three months the stools had become clay-colored whenever he had had an attack of colicky pains. This is of interest, because the statement

of such a condition would, especially some time ago, have been very misleading in making a diagnosis.

Operation: January 28, Dr. Carmalt. An incision of three inches was made over the prominence of the tumor. The tumor walls appeared smooth, shiny and non-adherent. An incision into the tumor proved it to be a cyst containing 4600 c. c. of a yellow, thick liquid, which weighed $11\frac{1}{2}$ pounds. This contained translucent bodies of the size of a marble. The hooklets and laminated membrane were discovered, but the scolices could not be found.

The cavity, which was situated in the lower right lobe of the liver was washed out and allowed to granulate up. In a short time the stools became clay-colored and a large amount of bile was discharged through the rubber drain. A small fistula into the gall bladder was discovered, but since on the administration of calomel the stools showed the presence of bile pigment it is thought that the bile passages are patent.

At present the patient is improving steadily, the wound is rapidly healing and the indications now are that the contracting cysts will become part of the gall bladder.

A CASE OF MALARIAL CACHÉXIA.—Through the kindness of Dr. Mariani, Dr. Ely was enabled to present a very typical case of Malaria Cachexia at the Junior's Medical Clinic last month. The patient was a woman, age 32, and a native of Naples, Italy. For the past four or five years she had complained of slight fever and some pain from time to time. She has resided in this country five months. Three years ago, while in Naples, she had been treated by Dr. Mariani for tertian malarial fever, which had yielded to quinine treatment. Since that attack there has been no history of chills or febrile paroxysms. Since her arrival here she had resided in a non-malarial district, but her condition has steadily grown worse. This is a peculiarity noticed in many of these cases; they can reside in an intensely malarial district without discomfort, but the change to a non-malarial region brings on an exacerbation of the symptoms. About five months ago the patient noticed a swelling in the left hypochondriac region, which continued to develop. At the same time the patient noticed that she was growing pale. Examination showed evidence of marked anæmia. In the left lumbar and hypochondriac regions there was a distinct tumor, freely movable and not tender, which, on palpation, was readily diagonalized as the spleen, symmetrically enlarged. It measured fourteen inches in length,

six inches in breadth, and the thickness was estimated at three inches. The stomach was displaced downward and to the right, the lower border being a hand's breadth below the umbilicus. The sharply defined lower border of the liver was clearly felt five fingers below the border of the ribs. The heart and lungs were normal. An examination of the blood revealed pronounced oligocythaemia and only 60° haemoglobin. Neither plasmodium malariae nor pigment were present; poikilocytosis was also very marked.

OPERATIONS AT HOSPITAL.—The following operations were performed at the New Haven Hospital, January 1 to February 15, inclusive. Drs. Carmalt, Russell, Ring and Swain were the attending surgeons.

Jan.	Jan.
1. Compound, comminuted fracture of humerus and scapula.	25. Sarcoma of ilium.
2. Hæmorrhoids.	Laceration of cervix and perineum.
5. Cataract.	26. Sarcoma of nasal cavity.
10. Ulcer of leg.	Ulcer of leg.
Fistula in ano.	28. Echinococcus cyst of liver.
11. Carcinoma of breast.	Hip joint disease.
Laceration of cervix and perineum.	29. Fibroid of uterus.
Cataract.	30. Adenoids.
12. Necrosis of tibia.	Feb.
Abscess of cul-de-sac of Douglas.	1. Appendicitis.
13. Fracture of frontal bone, collar bone and forearm.	Tubercular gland of neck.
18. Genu Valgum.	Carcinoma of breast.
	3. Metrorrhagia.
	8. Abscess of side.
	15. Amputation of finger.
	Appendicitis.

ITEMS OF INTEREST.

The two smallpox patients at Springside are out of danger and doing well.

The *Medical Times* says that peanuts will counteract the effect of alcohol on the nervous system without interfering with its exhilarating effects. The large amount of oil in the peanut is given as the cause.

The announcement of the birth of a son to the Duchess of Aosta is declared to be another triumph for Dr. Schenck, the embryologist, who recently announced his discovery of the

secret of sex, or the principles which regulate the production of male children. The Duchess of Aosta is said to have been a patient of Dr. Schenck, and to his careful treatment is due the birth of an heir to the Italian throne. The Duchess of Aosta is the third woman of high rank to demonstrate the efficacy of Dr. Schenck's treatment. The first was the Archduchess Frederick of Austria, and the second the Countess of Warwick. It is stated that Dr. Schenck has been in attendance upon a number of royal women who desire to bear sons for the inheritance of great titles.

Of the deaths of infants that take place during the first year, 25 per cent. occur in the first three months, and most of the causes of this mortality are beyond any medical remedy.

At the meeting of the Italian Hygienic Congress, recently held, October, 1898, at Turin, Dr. Abba reported that he had examined the holy water from thirty-four churches in that city, and that he had everywhere found it so contaminated that guinea pigs treated by an intraperitoneal injection died of tuberculosis.

The Imperial Medical Military Academy of Saint Petersburg held its centenary celebration on the 29th, 30th and 31st of December, 1898. Representatives were present from France, Germany, England, Scotland, Sweden and Switzerland. This school, which is under the patronage of the Czar, and the direction of the Minister of War, is the most important Medical School of Russia. It has seven hundred students; the course of study covers five years. The hospitals in connection with it are among the finest in Europe. The school was founded by the Czar, Paul I.

Dr. E. R. C. Earle, government medical officer at Lucea, Jamaica, gives in the *Lancet* for January 14, 1899, a detailed account of a Cæsarian operation he performed a few months since. The projection of a uterine tumor into the pelvic cavity prevented delivery and made the operation necessary. Much to his surprise, Dr. Earle found twins in the uterus, which he removed without accident. At the time of writing—seven weeks after the operation—the two children were alive, one well and strong, the other delicate. The mother was perfectly well and the tumor was causing her no trouble.

The College of Physicians of Philadelphia announces the next award of the Alvarenga prize, amounting to \$180, for July 14, 1899, provided an essay considered by the committee worthy of the prize shall be offered. The prize is derived from the income for one year of the bequest of the late Senor Alvarenga. Essays intended for competition may be upon any subject in medicine, but must be original and must be received by the secretary of the college on or before May 1, 1899.

An important advance in the manufacture of matches has recently been planned by two French engineers, M. Sévine and M. Cohen. The sesquisulphide of phosphorus is used in making them, a compound said to be intermediate between the ordinary white and red phosphorus. It gives off no fumes at ordinary temperatures and does not oxidize in the air, consequently the dangers to the makers of the matches from absorption are reduced to the minimum.

The report for the month of November of the Chicago Department of Public Health is very pleasant reading for those who are strong believers in the effective curative properties of antitoxin in cases of diphtheria. There seems to have been latterly a tendency on the part of a section of the medical profession in this country to endeavor to belittle the efficacy of diphtheria antitoxin and to contend that the benefits derived from its use have been exaggerated. Of 102 cases of diphtheria in Chicago in which the Klebs-Löffler bacillus was found, and which were treated by antitoxin, ninety-seven recovered, two remained under treatment, and three have died, giving the extraordinary low death rate of three per cent. Since the Health Department of Chicago introduced the antitoxin treatment for diphtheria, in 1895, a period of twenty-six months, a saving of life to the city is reported of 1,713, due to the use of antitoxin. These are most remarkable figures, and if statistics are worth anything at all, should put to rout the critics of the immortal discovery.

The theory that in the time of war the birth of males predominate, has, according to reports, received striking confirmation in this country during the last two months. Statistics show that there has been born within this period a large excess of males over females. Dr. Schenck explains this as due to the patriotic enthusiasm evoked among the women by the war. Another reason given is that, owing to her exalted feelings, the

American women ate more, and hence she was in better physical condition and accordingly gave birth to boys. The German professor claims, lastly, that a large number of American women followed his system, and, as a matter of course, produced children of the male sex. The fact, however, should be borne in mind, and we would bring it to the notice of any American woman who may be intending to adopt Dr. Schenck's plan, that the system may be carried to extremes. We can't get along without girls, and it would be no less than a grave public calamity if the boys were to exceed the girls say by two to one.

ALUMNI AND SCHOOL NOTES.

The next Yale Medical Alumni Association lecture will be given by Prof. Maurice H. Richardson, M.D., Professor of Clinical Surgery in the Harvard Medical School. The subject of the lecture will be "Inflammation of the Gall Bladder." The lecture will be given Thursday, March 15, at 8.15 p. m.

'95—Vertner Kenerssen, M.D., is now executive officer at the Government General Hospital at Fort Meyer, Va.

'96—S. M. Hammond, M.D., has removed his office to 105 College street.

'96—Dr. S. M. Heller has changed his address to 1945 Washington avenue, New York City.

'97—Dr. H. H. Briggs has returned from the South and resumed practice at his office on York street.

BOOK NOTICES.

An American Text Book of Diseases of the Eye, Ear, Nose and Throat. Edited by G. E. DeSchweinitz, A.M., M.D., Professor of Ophthalmology in the Jefferson Medical College, Philadelphia, and B. Alex. Randall, M.A., M.D., Ph.D., Clinical Professor of Diseases of the Ear in the University of Pennsylvania. A text and reference book of 1200 pages, with 766 engravings. Price \$7.00 cloth, \$8.00 sheep. Published by W. B. Saunders, Philadelphia, Pa.

Diseases of the Eye. A hand-book of ophthalmic practice, for students and practitioners. By G. E. DeSchweinitz, A.M., M.D., Professor of Oph-

thalmology in the Jefferson Medical College, etc. Third edition, thoroughly revised, with 255 illustrations. Price \$4.00 cloth, \$5.00 sheep. Published by W. B. Saunders, Philadelphia, Pa.

Fever Nursing. Revised edition, by J. C. Wilson, A.M., M.D. This volume covers the subject of fever nursing from the standpoint of the physician. The charts, which are numerous, are instructive and very helpful to the nurse. Published by J. B. Lippincott Co., Philadelphia and London.

The American Year Book of Medicine and Surgery. Edited by George M. Gould, M.D., assisted by fourteen of the leading authorities. A yearly digest of scientific progress and authoritative opinion in all branches of medicine and surgery, drawn from journals, monographs and text books, of the leading and foreign authors and investigators. The book is fully illustrated. Published by W. B. Saunders, Philadelphia, Pa.

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ACUTE INFLAMMATION OF THE GALL-BLADDER.

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Signs of old inflammation of the gall-bladder are often found at operations, and at autopsies. The lesions of acute inflammation are now to be observed most frequently during the surgical manipulations made necessary by an earlier recognition of this lesion. Occasionally a patient has succumbed to a rapid gangrene of the gall-bladder, to the bursting of an over-distended and septic gall-bladder, or to a chronic empyema with extravasation and general peritonitis. The frequency with which the gall-bladder is found thickened and contracted or extensively adherent to contiguous structures in patients with long-standing gall-stone histories, suggests that at one time or another a septic condition of the gall-bladder has existed, even if there have been no recognized attacks of a severe, or even of a moderate localized inflammation. Doubtless in many cases the attacks have been mild, but in some, at least, they have been severe; they may even have been serious, as abdominal lesions are now regarded, without a suspicion of their nature ever having been entertained. These cases have recovered under medical treatment, their true nature being masked by the prolonged sufferings of a supposed gall-stone colic. On the other hand, there is no doubt that many patients have perished as the direct result of an acute gall-bladder infection through a general invasion of the peritoneal cavity.

Though infection of the biliary passages may occur during the course of acute infectious disease, especially during typhoid fever and pneumonia, the greater number seem to take place independently of these affections, though they may owe their origin to the specific germ of the infectious disease. The bacteriology of gall-bladder infections is therefore of especial interest when the infection takes place during apparent health. The symptomatology is similarly interesting for the symptoms occurring suddenly, without premonitory signs, may suggest lesions remotely situated,—an appendicitis, an acute intestinal obstruction, an acute pancreatitis.

It is this uncertainty both as to diagnosis and as to infection that has made this subject one of great interest to me. With each additional experience new light is thrown upon the subject.

The influence of gall-stones in producing infections seems great, for in most, though not in all the cases, gall-stones have been found. Whether the gall-stones themselves are dependent in their origin upon bacteria may be open to question; that their presence invites infection seems highly probable. Gall-stones in the great majority of cases produce no changes whatever in gall-bladder or ducts, even if they occasionally are successfully expelled. When firmly caught in the cystic duct, or when so engaged as to cause a valve action, they cause an over-distention. This over-distention may or may not result in inflammation. In some, probably in most cases, if the duct has been for a long time completely plugged, the gall-bladder contains only a colorless fluid, a decolorized bile, or a limpid mucus. In others are found the characteristic appearances of an acute infection. The bile is thickened, dark, ropy, purulent. Such changes are usually due to the presence of a pathogenic organism.

Gall-stones may cause infection by direct changes in the mucous lining through pressure, thickenings, ulcerations, or other irritations. Infection of this altered wall may be so rapid and complete as to cause even hæmostasis and gangrene. Over-distention from causes other than gall-stones may result similarly, the mucous muscular and peritoneal layers becoming so changed that infection easily takes place.

Uninfluenced by gall-stones, acute cholecystitis depends chiefly upon over-distention, though the over-distention is probably itself the result primarily of infection of the cystic duct by which it becomes closed from swelling of the mucous membrane. As the gall-bladder distends, the obstruction to the cystic duct is increased, the gall-bladder becoming elongated toward and beyond the foramen of Winslow, and the duct dislocated and compressed. This manner of production is more or less theoretical, for it is impossible to say

whether the infection causes the distention, or the distention the infection. In a case of intermittent hydronephrosis, reported in "The Transactions of the American Surgical Association for 1897," I found the cause of valve-formation at the ureteral mouth to be a similar dislocation and compression of the ureter, though there was no pelvic infection.

The changes in the gall-bladder caused by gall-stones, and by valve action in the cystic duct, seem easily to be accounted for. The channels of infection, the kind of infection, and the source, are matters less easily demonstrated.

The micro-organisms found in the cases upon which this paper is based have been the bacillus coli communis, the pneumococcus, the typhoid bacillus. The colon bacillus would naturally proceed from the intestinal tract, through the common duct; but in the cases under consideration—occurring in apparent health—there have been no signs whatever of a cholangitis, either diffused or circumscribed; the infection has concerned the gall-bladder, and the gall-bladder only. Symptoms pointing to the liver have been absent. Moreover, in favorable cases, all constitutional symptoms have subsided immediately after operation. There have been no signs of infection in the common or in the hepatic duct. The pneumococcus and the typhoid bacillus may have infected through the duct or through the blood. It is idle to conjecture how these micro-organisms do infect; it is perhaps idle to speculate as to their source; but the fact of their presence seems interesting. In Case VII the pneumococcus was found in pure culture. There was no evidence of its presence in the patient's system beforehand; the man had been perfectly well. There was no infection by this micro-organism elsewhere in the body. In two cases (Case VIII and XI) the typhoid bacillus was demonstrated. There had been no typhoid fever in either case; nor had there been any in the community in which the patients lived. We may assume that the pneumococcus is frequently present in the alimentary tract of healthy individuals. Shall we assume that the typhoid bacillus is also? If not, shall we assume that the bacteria have been lying dormant for years? Shall we attempt to show that the original bacteria which excited into being the gall-stones still have power, years later, to excite a gall-bladder inflammation? Such an origin seems absurd. Investigations are now being made upon this subject at the Pathological Laboratory of the Massachusetts General Hospital by Dr. Mark W. Richardson, and the work thus far done seems to promise interesting results in connection with the bacteriology of gall-bladder infections.

small ones may lie together; a dozen may extend in a line from the fundus to the common duct—smooth cylinders with faceted ends. A single stone impacted in the cystic duct may be the sole cause of symptoms.

In some cases the stones are conglomerate,—made up of numerous small rounded stones; and presenting a hubbly appearance. The impacted stone has often a roughened surface to which the cystic duct clings so closely that it cannot be detached without being broken or crumbled. Such stones cannot be pressed out of the duct between the fingers; the operator must cut down upon and detach them. Smooth stones can be squeezed back into the gall-bladder between the thumb and fingers, even if the duct is contracted behind them.

Other characteristics, as to form, color, and consistency, are well known, and need not be mentioned. The friability of gall-stones enables the surgeon in urgent cases to crush the stone in the duct without the otherwise unavoidable delay of opening and closing the duct.

Variations in position of the cystic duct are not often demonstrated in acute infections. In some instances the patient is in such jeopardy that only the quickest operation for drainage is justifiable. If time permits, however, the cystic duct should always be searched for the occluding stone. The normal S-shape may be exaggerated by a chain of continuous stones. One stone impacted near the gall-bladder may be pushed, duct and all, before the distending gall-bladder, far beyond the foramen of Winslow, where it will sometimes be hard to discover it.

Adhesions are found between the gall-bladder and the duodenum, between the gall-bladder and the colon, and sometimes between the gall-bladder and the stomach. The gall-bladder is often completely isolated from the general peritoneal cavity. Extravasations are thereby prevented. In fact, the situation of the non-adherent gall-bladder is such that extravasations of moderate extent are limited to the right upper quadrant by the folds and mesentery of the colon. By adhesions septic fluids from the gall-bladder are still more limited, so that even in cases of virulent infections the surrounding peritonitis is generally confined to the immediate locality of the gall-bladder.

In severe gall-bladder infections, occurring after previous mild attacks, the changes show the effect of chronicity; adhesions are formed, peritoneal surfaces are thickened, opaque and rough, gall-bladder walls are much thickened, dense, friable; the mucous membrane is thickened and in folds.

In acute infections the bile may be comparatively unchanged; it may be thick, ropy, tenacious and purulent; it may be colorless and apparently bland. On the other hand, the contents of the gall-bladder may be pus,—the ordinary empyema of the gall-bladder. Fluids apparently sterile may contain organisms of virulence; others, apparently septic, may prove innocuous. In practically all cases, however, the discharge from the gall-bladder becomes quickly mixed with blood.

The symptoms of acute gall-bladder infections occurring during the course of acute infectious diseases may be limited to the gall-bladder, or may depend upon a general dissemination of micro-organisms throughout the liver. In the cases of this kind which I have seen, the gall-bladder has participated in the infection of the bile passages, and has not itself alone been the seat of contamination. Acute cholecystitis under these conditions presents symptoms which complicate the original disease,—symptoms which may be—and in fact often are—masked by those of the original disease; but yet symptoms which sooner or later point unmistakably to the gall-bladder and bile passages.

The symptoms of an acute gall-bladder infection vary between wide limits,—some are easily understood; some are hard to account for. In some cases the symptoms point unmistakably to the gall-bladder; in others, to the appendix. At times they indicate an acute intestinal obstruction; at others, a general peritonitis. Unless the physician has distinctly in mind the possibility of a gall-bladder lesion he may be deceived.

As in most acute abdominal lesions, pain is the first and the most important symptom. The seat of the pain is usually indefinite at first, though it may soon become localized. It is at first sharp and colicky, becoming later constant and severe. The pain, not being due to the passage of a gall-stone, but rather to an excessive distention of the gall-bladder with germ infection and localized peritonitis, soon assumes the characteristics of an localized peritonitis, and as such, simulates closely the course and onset of the pain in appendicitis. It may, therefore, be at first general—an intermittent cramp in the epigastrium, or a diffused intestinal colic, which later is localized more or less distinctly in the right upper quadrant. If the pain is dependent upon an expulsive muscular spasm, it will be intermittent and paroxysmal, radiating from the gall bladder and affecting distant parts,—the dorsal thorax, the shoulder. The pain soon, however, becomes steady and severe in a localized position, unless masked by the symptoms of intestinal obstruction, which for some unknown reason become prominent

in certain instances. Indeed, were it not for the obscuring symptoms which often mask the onset of acute gall-bladder infections, the pain would invariably point with marked distinctness to the gall-bladder. The pain persists, unless relieved by opium. The cause of pain is partly the over-distention, partly the infection, partly the contiguous peritonitis, and sometimes the intestinal obstruction which seems really to exist.

With the pain a tenderness appears, which, at first general, may become localized; or, at first localized, may become general. The tenderness, usually extreme, points directly to the gall-bladder in some cases; in others to some other organ. As a rule, however, it is in the right upper quadrant.

Fever is so common in acute cholecystitis that it may be said to be constant,—in fact, the absence of fever is enough to rule out the lesion. The temperature and pulse are usually high, or variable in infections of the typhoid and pneumococcus bacillus; moderate, in those of the colon bacillus.

Vomiting may be said to be as common a symptom in this affection as in appendicitis. It is usually present in the early stage; it may subside in a few hours, or may increase with the spread of the peritoneal invasion. When the infection becomes general, it is usually constant.

Chill may or may not be observed. Its presence or absence seems of little importance; for in extensive infections it may be absent; in mild, it may be present. So far as it goes, it is confirmatory of septic absorption.

Distention is observed in those cases which resemble acute intestinal obstruction, and which are accompanied by obstipation. These symptoms are hard to account for, because there is no real mechanical obstruction, and no paralyzing general peritonitis. It has been suggested that the invasion of the hepatic flexure of the colon by the peritonitis may cause a local stasis sufficient to simulate a complete obstruction. In one case an exudate was found about the colon sufficient to compress it very considerably.

Rigidity of the abdominal muscles over the affected region may be present in the early hours of the invasion. Muscular rigidity soon disappears, however, as it does in acute appendicitis, with localization of the infection.

A tumor in the region of the gall-bladder can be made out in the majority of cases. The tumor is hard and tender, and its seat the costal cartilages at the outer border of the rectus. The exact situation of the tumor varies somewhat with the distensibility and shape of the gall-bladder. At times it is some distance below the

costal border, and resembles closely the tumor of an appendicitis situated unusually high.

In many cases no tumor can be felt, even when subsequent operation demonstrates a very large and tense gall-bladder.

The later symptoms may become gradually merged, in unfavorable cases, in those of a general peritonitis.

The diagnosis of acute cholecystitis is difficult in those cases in which the local symptoms are masked by general symptoms. In the majority of cases, however, it is clear, and depends upon a tumor in the gall-bladder region accompanied by the signs of sepsis, with or without a history of gall-stones.

Pain, with tenderness in the gall-bladder, a perceptible tumor at the usual seat of the gall-bladder, constitutional symptoms, and leucocytosis, especially when a history of previous gall-stones colics is elicited,—are symptoms which can hardly be misunderstood.

General pain, situated high up in the right upper quadrant, with tenderness in the usual seat of the gall-bladder, with fever and other signs of infection, may or may not mean an acute cholecystitis, if there is no tumor and if there is no history of gall-stone colic. Such a group of symptoms may be caused by a gastric or a duodenal ulcer, or an abscess about the kidney, or an appendicitis high up.

The surgeon is often brought face to face with symptoms so severe as to demand immediate operation when it is impossible to make a positive diagnosis. He can in such cases make a diagnosis definite enough to limit his field of exploration to the right upper quadrant, to the region of the gall-bladder, the pylorus, the anterior and upper right kidney borders, the liver, the diaphragm, or even the pancreas. So far as my experience goes, symptoms not pointing clearly to the gall-bladder may sometimes lead the exploring hand to a lesion of some other organ,—a lesion quite as important as that of the gall-bladder. They will not lead him surely to the gall-bladder in all cases. The diagnosis cannot be made with certainty.

With the assurance of previous gall-bladder colics, however, the gall-bladder source of the symptoms is tolerably evident. But what shall we say of cases presenting sudden pain, tenderness, vomiting, rigidity, distention, fever,—cases in which all these signs point to the epigastrium in a young man of perfect health,—point to an extensive extravasation of septic fluids? We may say "Acute Cholecystitis," and find a perforation of the stomach; or "Perforation of the Stomach," and find an appendicitis. Such an experience has strengthened the feeling of diffidence with which I undertake to make a positive diagnosis in acute abdominal lesions. In the young

man in question there was a perforating ulcer of the anterior wall of the stomach, near the pylorus; the liver, gall-bladder, duodenum, and colon were covered with the green exudate of twenty-four hours. Drainage and suture saved him.

The chief point in right upper quadrant diagnosis is to recognize symptoms that demand exploration, whether they point to the gall-bladder, the stomach, or pancreas, or kidney.

At times, however, diagnosis is impossible. The group of symptoms comprises sudden general pain in persons of good health, vomiting, general tenderness and rigidity, distention, obstipation, fever, and leucocytosis. The signs point as much to the appendix as to the gall-bladder; to the stomach as to the appendix; to the pancreas as to the intestine; to an internal strangulation as to a thrombosed mesentery. In such cases a diagnosis is impossible and the surgeon's knife is not guided to one side more than to the other. He must explore in the median line,—he cannot easily decide whether to go above or below the umbilicus, though the majority of lesions are below rather than above the navel. As to diagnosis in such cases—and two are herewith reported—not only is an exact diagnosis impossible, but a guess even is unreasonable. I would urge that among the possibilities in such cases should be remembered acute septic processes of the gall-bladder.

In such difficult cases a ray of light is thrown by a history, no matter how obscure, of gall-stones. Would one be justified in forsaking the median line for so uncertain a guide? True, in suspected abdominal hemorrhages the faintest symptom of pregnancy is enough to justify the exploration of a possible extra-uterine pregnancy; but such explorations are made in a line quite favorable for remedying other abdominal emergencies. A gall-stone history should at least direct immediate attention to the gall-bladder after median incision, even if it does not indicate a lateral incision. In one case herewith reported there was a history of gall-stones, but the symptoms seemed so clearly intestinal obstruction, that the gall-bladder was not even thought of until the characteristic recent adhesions were felt.

As a possible cause, acute cholecystitis should always be borne in mind in cases of general peritonitis of unknown origin.

The prognosis in gall-bladder infections varies with the nature and extent of the infection,—factors which cannot be estimated without exploration. The chief danger is from perforation of the gall-bladder, with or without total gangrene.

Complete gangrene of the gall-bladder is rare; yet in several of the cases herewith reported the gall-bladder walls were appar-

ently in beginning necrosis. In many the distention was so great that rupture seemed imminent during the manipulations of the initial exploration. What the course would have been without operation it is impossible to assert, but my opinion is that the result would have been fatal in many of the cases. In two death occurred, in spite of drainage, the peritoneal cavity being already infected. In all cases without general infection, recovery followed drainage.

The doubt as to the essentially fatal nature of these infections arises from those not infrequent cases of cholecystotomy for chronic cholelithiasis in which there is unmistakable evidence of previous inflammation. Possibly an examination of the patients upon whose cases this paper is based, in some of their previous attacks of severe and prolonged pain, would have shown an inflammation quite as acute and severe as that present at the time of operation.

Taking the cases together, and considering all their phases, it seems fair to say that acute cholecystitis in the beginning presents as serious an outlook as acute appendicitis; that perhaps the majority of cases recover under palliative treatment, though many go on to hopeless general infections. Acute inflammation of the gall-bladder demands, perhaps even more strongly than acute inflammation of the appendix, surgical intervention. Like appendicitis, the disease is a constant menace to life, till the cause is removed, the most favorable time for operation being when the patient is in health; but, like appendicitis, many cases demand in the most urgent way, immediate surgical relief.

The treatment of acute cholecystitis should be surgical, unless the symptoms, clearly subsiding, encourage the expectation of recovery with an operation when the disease is in a state of quiescence. In most cases the surgeon is called when the symptoms are so urgent as to admit of no delay. In simple dilatation of the gall-bladder, without evidence of sepsis, exploration may be undertaken at any convenient time; unless there are clear contra-indications, the cases should all be operated upon at some time. Acute infections are more safely treated surgically than medically, for the reasons already given.

The chief object of surgical treatment is temporary drainage of the gall-bladder. If gall-stones are found, they should be removed. If the patient is in a grave condition which a prolonged operation would make hopeless, no attempt should be made to locate and remove an impacted stone, for this operation is much more difficult than simple drainage. The emergency passed, the stone, if any remains, may be safely sought in a period of health.

The incision should be made over the fundus of the gall-bladder. It may be parallel to the border of the ribs, or through the linea semilunaris, or even through the rectus. A favorite cut is diagonally toward the iliac crest. Through a small incision the parts should be at first explored with the finger, to verify the lesion. The cut should next be enlarged to admit the hand. A gall-bladder that cannot be felt before operation may be found directly under the abdominal wall. The fundus will be found buried among recent adhesions, which glue it to the omentum, liver, colon, and duodenum. These adhesions may be extensive enough to prevent contamination of contiguous peritoneum during the operation. It is best, however, to prevent extravasation by careful walling. Gauze strips should be packed above and to the left, to guard the gastric and phrenic regions; below and to the right, to protect the colon and kidney. The fluid contents of the gall-bladder are first removed by aspiration. The gall-bladder is next incised freely, an opening large enough to admit the finger being made. The contents are removed by means of scoops and long forceps.

The gall-bladder may be washed out with sterile water through a glass tube. The infected water may soak through the gauze walls, however, and infect beyond them, though I have never met with this accident. The interior of the gall-bladder may be wiped dry with gauze strips. After cleansing carefully the field, the walling strips above and to the right should be removed to permit digital exploration of the cystic duct. If a stone is found impacted there it should be squeezed back into the gall-bladder. If this manipulation is impossible, the duct must be incised, the stone removed, and the wound closed. This need not be done in cases of grave immediate danger. A rubber drainage tube is next placed in the gall-bladder and fastened to the skin with a suture, to prevent its dropping out. The tube should not press too deeply into the gall-bladder; but should go about half way to the duct. Too deeply placed, it may cause ulceration and hemorrhage. If there is hemorrhage from the gall bladder, a narrow strip may be packed alongside the tube in the gall-bladder. If there has been much soiling of the field, a small strand may be placed under the gall-bladder as far as the foramen of Winslow. The edges of the gall-bladder are next stitched to the abdominal wound, a small opening being left for the deep external gauze strand. The wound is closed as far as the strand, and one or two sutures are placed above the gall-bladder.

If the cystic duct is clear, bile may begin to flow at once. Often it is delayed several hours. If no bile comes at any time, there is probably still an obstruction at the cystic duct which may require

a second operation. The packing is loosened gradually, beginning at the third day. At the end of a week it is removed entirely, with the drainage tube. The gall-bladder empties directly into the dressing. At the end of four or five weeks the wound is usually closed.

The cases upon which the foregoing remarks have been chiefly based were published in detail in the *American Journal of the Medical Sciences* for June, 1898. There are, in addition, several cases which are herewith published in detail.

Case I.—Mrs. C. D., a woman of 62, was taken October 9, 1897, with symptoms of mechanical intestinal obstruction. It was supposed that she had a malignant stricture of the sigmoid flexure, which had become suddenly plugged. Appendicitis was also considered as a possible cause. There was no positive guide to the lesion, and a median cut was made long enough to explore the whole alimentary tract. After prolonged examination, in which nothing wrong was found, the seat of the trouble was detected in the gall-bladder, which was felt distended and adherent to the surrounding parts. An incision was then made over the gall-bladder, which contained hundreds of minute gall-stones and a dark, offensive fluid. The gall-bladder was drained and the stones removed. The patient died in a few hours from peritonitis and shock, the peritonitis being found quite extensive in the right upper quadrant.

Case II.—H. A. W., a man of 40, in February, 1894, was taken with what was supposed to be appendicitis. His general condition was so serious that an operation was undertaken as a last resort. The remains of an old appendicular inflammation were found. Exploration in the upper part of the wound revealed a distended and inflamed gall-bladder. The gall-bladder contained no gall-stones. The infection was from the colon bacillus. This man made a good recovery.

Case III.—Mrs. E. J., a woman of 61, was seen on August 24, 1895. She had attacks of pain in the abdomen which suggested an obstruction of the bowels, or an ovarian tumor with a twisted pedicle. A smooth, rounded tumor could be felt under ether in the region of the ascending colon. Then it seemed as if there was an intestinal obstruction, and that this tumor was the dilated colon. The tumor was found to be a distended gall-bladder, containing about a hundred faceted gall-stones. The gall-bladder was everywhere adherent, and contained about a pint of bile. This patient made a good recovery. The nature of the infection was not determined.

Case IV.—John K., male of 28, was operated upon at the Massachusetts General Hospital in May, 1896, for what was supposed to be appendicitis and general peritonitis. The appendix was normal. The gall-bladder was next explored and found to be distended and adherent, and in a condition of acute gangrene. The gall-bladder was drained. There was a general peritonitis. Death took place on the fourth day, and the autopsy showed a general peritonitis and a gangrenous gall-bladder. There were no gall-stones. The hepatic flexure of the colon was covered with fibrin, and its lumen was nearly occluded by adhesions.

Case V.—Major G. S. M., aged 56, in September, 1896, was found with extreme pain in the abdomen, with distention. There was vomiting and hiccough, high temperature and feeble pulse. There was a tense, rounded, tender tumor in the region of the gall-bladder. It was clear that this was case of acute cholecystitis. The gall-bladder was drained, and, although the prognosis seemed absolutely hopeless, the patient made a good recovery, and remains well. There were no gall-stones. Cultures from the fluid showed a mixed infection of bacilli and cocci of various sizes. It was impossible to determine their nature.

Case VI.—Mrs. C. M., a woman of 33, was taken September 17, 1896, with severe pain in the epigastrium, and with vomiting. A tense and tender gall-bladder could be felt. This was opened, and a number of gall-stones were removed. The gall-bladder contained also white mucous. Her condition was such that extensive exploration could not be undertaken. Some weeks after the wound had become entirely closed, there was a recurrence of the pain. Examination showed that the gall-bladder had become distended again. A small opening was made into it, and white mucous was discharged. For a year or two the gall-bladder continued to refill and cause pain. The pain and distention were relieved by opening the gall-bladder. Finally I opened the abdomen again, and removed from the cystic duct an impacted stone. After this operation the patient recovered, and her symptoms were entirely relieved.

Case VII.—Dr. F. E. K., physician of 34, had typical symptoms of appendicitis. He himself, and the attending physician made the diagnosis, in which I concurred. The appendix was exposed by the usual incision on November 28, 1896. The appendix proved to be perfectly normal. Guided by former experience, I next examined the gall-bladder, which was tense, distended, and adherent. The incision was carried up a short distance, the gall-bladder opened

and drained. A number of large, irregular gall-stones were removed. This patient made a good recovery. An examination of the fluid showed infection by the pneumococcus.

Case VIII.—Mrs. C. P., aged 59, had had an attack of acute inflammation of the bladder some days before my visit, with acute pain in the right upper quadrant of the abdomen. A tumor was found, the nature of which it was impossible to make out. It had been supposed to be a tumor of the kidney. Immediate operation did not seem advisable in this case. Three weeks later, however, the symptoms became more severe, and I advised operation. The gall-bladder was found distended and inflamed. A cylindrical stone was found impacted in the cystic duct. This was removed with great difficulty. The patient recovered. A culture taken from the bile showed the typhoid bacillus. There were no symptoms of typhoid at the time, and there had been no typhoid in the community.

Case IX.—Mrs. S., a woman of 67, was taken with severe pain in the epigastrium on November 3, 1897. There were marked constitutional symptoms. A tender tumor could be felt in the region of the gall-bladder. A diagnosis of acute cholecystitis was made, and an operation was immediately performed. The gall-bladder was found to be distended and everywhere adherent. It contained numerous calculi. The gall-bladder was drained. Cultures taken from the gall-bladder showed numerous bacteria of different kinds, which were supposed to be contaminations. The patient remains well.

Case X.—C. F. M., aged 58. August 7, 1897. Patient of Dr. Odlin, of Melrose.

For a good many years he had had attacks of gall-stones, without jaundice.

On August 5, he was taken with severe pain in the region of the gall-bladder, with constant vomiting. The pulse was 120 from the first; temperature not taken. A painful tumor could be felt in the region of the gall-bladder. The abdomen was rigid over the right upper quadrant. There was great tenderness over the tumor. The general condition was bad. The pulse was of poor quality, and the rate 120. The facies was bad.

The diagnosis presented no difficulties. The gall-bladder was evidently distended and inflamed, and contained gall-stones.

Immediate operation was decided upon. Through an oblique incision the distended gall-bladder was exposed. The gall-bladder

was aspirated and then opened. No gall-stones were to be found in the gall-bladder. The patient's condition was so bad that no effort was to explore the cystic duct. In color the gall-bladder was dark gray, with a bluish tint. The mucous membrane was dark with hemorrhages.

Examination of fluid from gall-bladder by Dr. M. W. Richardson, August 9, 1897:

1. Swab.—Probably a variety of colon bacillus.
2. Fluid.—Dark muddy brown; alk.; 1014. Sed. consid. Alb. 1%. Bile present. Sed. consid. light green amorphous material. Small, round degenerated cells in consid. nos. Occasional large squamous cells. Many bacteria.

A good recovery followed the operation, though the strength returned but slowly.

July 11, 1898, the patient came to me for examination. I found him in excellent health.

This case is interesting because of the absence of gall-stones. It seems reasonably certain that no stone was in the cystic duct, because the bile flowed freely from the wound, and the wound finally closed firmly without a re-distention of the gall-bladder such as took place in Case VI.

Case XI.—Mrs. N. S., aged 63. November 1, 1898. Under the care of Dr. Willis, of Waltham. This patient had been subject to gall-bladder colic for two years. The liver was enlarged and the gall-bladder perceptible. She had never been jaundiced. The present attack began two weeks ago with pain, vomiting, fever, and chill.

October 27, the temperature was 106°, and for several days it rose to that point with daily chills. One morning it was 96°. Highest pulse 110.

Dr. Fitz saw the patient October 30, and made a diagnosis of acute cholecystitis and gall-stones.

The gall-bladder could be felt distinctly. It was tender and resistant. There was no evidence of a general peritoneal involvement. The gall-bladder was immediately opened and several large gall-stones removed. A satisfactory recovery followed.

Fluid from the gall-bladder examined by Dr. M. W. Richardson, November 1, 1898:

1. Dirty brown fluid. Micro., a consid. no. of epithelial cells. A few small round cells. Rarely a red blood corpuscle. Much fine granular detritus.

2. Swab from fluid. Pure culture of mobile bacillus. Typhoid bacillus.

Typhoid culture showed characteristic growth in bouillon, potato, agar, blood serum, gelatine. Medium of Hiss, litmus, milk and sugar agar. Also reacted to typhoid serum.

Case XII.—D. B., aged 29. Seen on Feb. 17, 1899, in Springfield, in consultation with Drs. Clark and Hooker.

This man had had attacks of gall-stones for a year or more,—some twelve attacks in a year. The attacks had gradually increased in frequency and severity. General health good; never jaundiced. There was great tenderness in region of gall-bladder, with fever and vomiting. Highest temperature 101° . With the last attack the vomiting was excessive and the straining terrible.

Immediate cholecystomy. Numerous gall-stones in a dark, ropy, puriform fluid. Patient's condition too bad for exploration of the cystic duct. The gall-bladder was drained in the usual way, and a good recovery followed. In spite of the general appearances in this case,—great distention, discoloration, recent adhesions, septic looking fluid,—no growth was obtained by culture. The case seemed to me one that might at any time have resulted in rupture and general peritonitis.

Case XIII.—James M., farmer, aged 64, entered the Massachusetts General Hospital on March 15, 1899. The family history was negative. The patient had typhoid fever thirty years ago. With this exception he had always been well. Six months before entrance he was suddenly taken with pain in the right hypochondrium, extending toward the median line. This was followed almost immediately by chill and vomiting. The pain lasted two hours. A month later he had a similar attack,—pain followed by chill and vomiting. At the end of another month he had a third attack. Since that time he has had no more attacks of pain. During the last three months he has had chills every two or three weeks, but no vomiting. The last chill occurred the day before entrance. No urinary symptoms. Bowels regular. He has lost fifty pounds in weight during the past six months. He thinks that the chill was caused by over-eating.

On examination I was unable to detect any tumor in the region of the liver, though the liver itself could be felt two inches below the costal margin. On March 20 the temperature rose at night to 102 , without pain or tenderness. On the 23d he had a chill. The

temperature rose to 104.6. The patient thought that he caught cold at the clinic in the morning. My attention having been directed particularly to this subject by the reading of this paper on the 23d, and especially by reviewing Case XI, I strongly suspected that there was an infection of the gall-bladder; and, from the chill and high temperature, it seemed possible that it was an infection by the typhoid bacillus.

Under ether nothing could be felt. The localization of the pain in the region of the gall-bladder, with the strong suspicion of a gall-bladder infection, led me to make a vertical incision at the outer border of the right rectus. The fundus of a tense gall-bladder presented immediately in the wound. The thin edge of the liver was granular in appearance. The gall bladder was aspirated and twenty ounces of fluid removed. The fluid was thin, not ropy, bright green in color. Its appearance was very unusual. It was evidently bile, changed by retention and infection. A single large, rough stone was found at the orifice at the beginning of the cystic duct. On removing this stone, large quantities of normal bile poured out of the gall-bladder. No stone could be felt in the cystic or the common duct. The gall-bladder was washed out with salt solution. The edges of the gall-bladder were fastened into the wound in the usual manner, with rubber drainage tube and gauze drain. The temperature immediately became normal, and the patient is now doing well.

Case XIV.—This case, though not a cholecystitis, may prove interesting in connection with this subject:

Mrs. L. W., aged 71, a woman of good general health, a patient of Dr. Stickney, of Arlington, was taken March 20, 1899, with pain in the side of the abdomen, just below the border of the liver. Dr. Stickney said that "several years before she had an attack of pain and slight jaundice. With the present attack there was nausea without vomiting. The bowels had been somewhat irregular, and they were thoroughly moved. The temperature was 101° at noon. In the region of the gall-bladder and extending downward to the right, there was a tender mass,—oval, smooth, tense, about the size of a small grape fruit. Between the tumor and the liver there was a distinct sulcus. The tumor moved with respiration. There was slight jaundice. The urine was normal in character and in amount. At one time it was ammoniacal, but quickly became normal under benzoic acid." I saw this patient first on March 26, 1899. She stated that there had never been any suspicion of gall-stones. She

had always been well. No one in the family had noticed that she was looking less vigorous than usual. She stated that eight years before she had had an attack of soreness in the bowels, but nothing like the present. Eighteen years before she had had a similar attack, being sick a few days with pain in the same place. The physician told her at that time that there was a bunch there. The pain in the present attack came on at night without a moment's warning. There was neither vomiting or chill. The patient was for her age a vigorous woman, well nourished, but rather spare. The pulse was 108; the temperature 102. She was slightly jaundiced. A large, elastic tumor could be felt filling the space below the liver and extending below the level of the navel. The lower border was tympanitic; the upper dull, merging into the liver flatness. The mass extended backward into the right renal region. It moved with respiration. Repeated examinations of the tumor showed it to be large, tense, smooth, globular, and tender. The percussion was dull at the upper portion and tympanitic at the lower. It suggested at times fluid; at times gas,—an excessively distended and inflamed gall-bladder or an excessively distended colon.

If a tumor containing fluid, it seemed probable that it was a gall-bladder, a hydronephrosis, an echinococcus cyst or possibly a pancreatic cyst. The third was excluded, from its rarity; the second from the absence of urinary symptoms and the infrequency of attacks. Pancreatic cyst was not seriously considered. The chances seemed in favor of an acutely inflamed and distended gall-bladder. Operation was proposed for the following morning.

On the following day, however, the temperature dropped to normal, the tumor seemed less tense. There was less pain and less tenderness.

On March 31, 1899, Dr. Stickney reported as follows: "Mrs. W. improved for two or three days. The gall-bladder became smaller. The temperature got normal. Yesterday morning the temperature was 99; the pulse 90. She seemed in first-rate condition in every other way. There was no perceptible change in the size of the tumor. To-night the pulse is 104; respiration normal; temperature 102.7. The tumor is very much increased in size,—very tense, extending beyond the median line, and downward toward the pubes, it goes back to the kidney and is easily palpable between the two hands. It is as large as an enormous grape-fruit, oblong, like a very large cocoanut. It is hard and tense, much more so than when you saw it. It feels like palpating a football. It is

perfectly flat. There is a tympanitic area between this dulness and the liver dulness."

On April 1, 1899, under ether the boundaries of the tumor could be easily be made out. It was apparently connected with the liver, for it moved with it. It extended as far to the left as the outer border of the left rectus. Its lower border went to the pelvic brim. Posteriorly it filled the right lumbar region. It seemed unlikely to be a gall-bladder. Incision showed a tumor covered by loose peritoneum. Between the tumor and the liver, in the sulcus mentioned above, the normal gall-bladder projected. The tumor was attached posteriorly to the region of the right kidney and pancreas. It was impossible with the tumor exposed and with the whole hand introduced, to tell the nature of the mass. The kidney could be felt in the right, however, and it seemed probably renal. By aspiration one and a half pints of odorless pus were withdrawn, The tumor was then seen to be a pyonephrosis, the kidney remaining as a thin walled sac, collapsed in the depths of the abdomen.

The sac was easily delivered; its attachments were separated, tied and cut. The ureter was found completely obliterated. On the following day the pulse was 80, the temperature normal, and the patient's general condition excellent.

This case, though not an acute cholecystitis, was thought to be one. It illustrates the difficulty with which a diagnosis is made in tumors suggesting distended gall-bladders. Certain of the cases recorded above show that a cholecystitis may be present when unsuspected; this case shows that a cholecystitis may not exist even when it is strongly suspected. In this, however, as in all the preceding cases, the symptoms demanded exploration so plainly that an accurate diagnosis, however desirable, was not essential.

In two other recent cases a distended gall-bladder was found, with impaction of a stone in the cystic duct. In one the stone was detached only by cutting into the duct and removing piecemeal a rough stone. In another, ten large cylindrical stones extended in a chain from the cystic duct to the gall-bladder fundus. The gall-bladder was tense to bursting. At the deeper extremity it was adherent by fine, easily separated adhesions. The culture was sterile in each case. It is hard to understand why these gall-bladders did not burst under the great pressure of retained secretions.

A careful study of gall-stone cases will show that at one time or another the gall-bladder is likely to become infected. The history of gall-stones always suggests, in acute abdominal cases with symptoms high up in the right side, the possibility of an acute cholecys-

titis. In most cases the attention, once directed to the gall-bladder, will result in a correct diagnosis. A certain number of cases, however, will in history, inception, and course, be so obscured that the gall-bladder will not be even suspected. The possibility of a cholecystitis should never be forgotten, therefore, in obscure, virulent, fulminating infections of the abdominal cavity. No acute abdominal lesion presents greater possibilities for error in diagnosis, or greater possibilities for success after timely surgical intervention.

A CASE OF ACROMEGALY.

Preliminary Notes

BY O. T. OSBORNE, M.D.

Professor of Materia Medica and Therapeutics at Yale.

The patient is a man of American parentage, forty-two years of age, who had always been in excellent health up to four years ago.

The family history shows nothing of interest, and he himself denies absolutely any specific infection. The first signs of disability, occurring four years ago, were weakening of the leg muscles, and impairment of vision." This visual disturbance has steadily increased, till, now, he can barely read with the right eye, and the left is almost sightless. There are no ear symptoms; neither tinnitus or loss of hearing. Also there is no history of headache and the mental condition is good.

For some time he has noticed gradual enlargement of the hands and feet, the latter especially, till now they have reached an enormous size.

Although the legs grew weaker and weaker, the patient continued to work for one year, till one day he had a "faint turn," falling down, and remaining in a stupor for two days. On emerging from this state, he found that his legs were paralyzed. There has been no paralysis of the arms or of the vocal apparatus, nor any disturbance in the action of the sphincters, rectal or vesical.

His appetite is excellent, but during this year in bed, he thinks his hands and his body have emaciated. The hands do not show signs of myxœdema, but the bones are greatly enlarged. The feet show considerable swelling, some of which is due to œdema.

He is kyphotic, and the chest is enlarged, as usual, antero-posteriorly. The head is enlarged and there is the usual massive face with its prominent supra-orbital ridges, large nose and jaws, but with no prognathism, the teeth exactly meeting when the jaws are closed. The mouth, tongue, and larynx, likewise, are enlarged.

The left retina cannot be seen owing to an interstitial keratitis. As above stated, syphilis is denied. The right optic nerve shows atrophy, but not very marked, and is but slightly choked.

The patellar reflexes are absent, but the sensation of legs and feet is good. The only symptom he complains of is pains in the joints of the lower extremities.

The above is a brief history of a case that I discovered this last summer while on my vacation in Maine.

I am endeavoring to treat him with pituitary extract, but fear I cannot successfully follow the case at this distance.

ON MALARIAL DISEASE MISTAKEN FOR AN AFFECTION OF THE EAR.

By D. B. ST. JOHN ROOSA, M.D., LL.D.

Professor Emeritus Diseases of the Eye and Ear, New York Post-Graduate
Medical School and Hospital; Surgeon to the Manhattan Eye
and Ear Hospital.

Since malaria has been recognized as a disease, it has been known by the profession that it colors every affection that it touches. In other words, a person once having been affected with true malarial fever, is never safe from attacks, for the whole of his life, either as a complication with other diseases, or as a separate malady. Like syphilis, once having been affected with it, it is almost necessary to be born again, to escape some manifestation of it during life. I am well aware of the skepticism in some high quarters, as to the frequent occurrence of malarial attacks in New York City, but, after very serious consideration and observation, of a large number of cases, I fully believe that in the course of ophthalmic and aural diseases or in connection with them, and sometimes, independently of any real disease of the eye or ear, ocular or aural symptoms arise, which are due entirely to malaria, and which are erroneously ascribed, in some instances, to specific influences, in others, to intra-ocular and intra-aural diseases, or to errors of refraction. I have already written, in my work on the *Eye*, on the simulation of asthenopia by malaria, and in this paper, I propose simply to speak of aural symptoms, having their origin in malarial disease, yet improperly ascribed to conditions in the ear.

During the last year, I had two cases, one of chronic suppurative otitis, the other of acute suppurative otitis, with inflammation of the mastoid, in which a very high temperature suddenly occurred, without any cause in the condition of the ears to account for it, and which were promptly relieved by proper doses of quinine. In the mastoid case, which was that of a girl of about eleven, a daughter of an army officer stationed at West Point, the symptoms occurred when the wound which I had made in the mastoid, was well drained and aseptic. The patient was a private case in the Manhattan Eye and Ear Hospital. The house surgeon promptly recognized the malarial character of the disease, and began the treatment with quinine, which I continued, with complete relief.

Within a week there was a relapse, which was only partially anticipated. But in a month all the symptoms entirely disappeared. The patient made an excellent recovery from the mastoid disease, a recovery which was not in the least retarded by the malarious symptoms. It may be proper to say that true malaria frequently occurs at West Point.

In the other case, that of a boy of about ten years of age, in the Post-Graduate Hospital, treated for chronic suppurative otitis, confined to the tympanum, the symptoms were equally marked, and the relief from anti-malarial treatment quite as speedy. This child also made a complete recovery, as far as the malaria was concerned, although the ears, the drum-heads being destroyed, can never be entirely sound. He was from a part of New Jersey noted for malarial disease.

I am aware that those who insist upon the demonstration of plasmodium in the blood, before they will admit the diagnosis of malaria, may not be entirely satisfied with these cases, but I think any good clinical observer, who had watched them with me, would have been. Both of the subjects had been living in malarial regions, and gave a clear history of preceding attacks.

The following case, I consider more important, perhaps, than either of the foregoing, because the fear of giving quinine in aural disease prevented the patient's attendants from giving him the medicine that he required, and thereby delayed his restoration. The patient, whose case I am about to relate, is a very prominent physician in a neighboring State, living in a region well-recognized to be malarial. He had had previous attacks, and he knew his condition so well, that he had hitherto taken the responsibility of prescribing for himself. On this occasion, however, the attack being different from various ones and rather more severe than usual, he did not do so, and, until he reached me, he was not allowed to take quinine, under the fear, that I have mentioned above, that his aural disease contra-indicated it. The result shows that his aural disease was caused by malaria. I have asked the doctor to write his medical history himself, which he has very kindly done:

"October 1, I left my home to go to New York city, feeling in good health. On leaving the ferryboat I walked up Barclay street. When I reached Greenwich street I suddenly felt very dizzy. The dizziness left me in a few minutes, but returned several times before I reached the St. Paul building, on the corner of Broadway and Ann street. At no time did I lose consciousness. On my way home, half an hour later, I became so dizzy that I staggered and leaned up against the post office building, until the dizziness passed away. I returned to my home, and about 6 p. m., not only felt dizzy, but became sick at my stomach. I vomited considerable, after which I felt relieved. I retired early and slept well. The next morning I felt as well as usual, and did considerable work until about 3 p. m., when I had a very dizzy spell. I returned to my home

and had another attack of vomiting, but the dizziness was not relieved. I went to my bed and remained there three days. I attributed my trouble to a severe "bilious attack." Took pill fg. gr. X, followed by magnes. sulph. While in bed I took, upon the advice of my attending physician, iron and strychnia. When I left my bed, I found that I was deaf in my right ear, and was still dizzy. I concluded that my ear was filled with hardened wax, and was the cause of my trouble. Examination of the ear proved this to be false. I then had my ear examined by a specialist, and he pronounced my trouble to be "Menière's Disease." I disagreed with him, and claimed that my trouble was caused by malarial poisoning, and felt sure, if I took quinine, I would improve. He advised strongly against quinine. I then consulted Dr. Roosa, and he agreed with me as to the cause and treatment. I then commenced and continued to take quinine, gr. V, every four hours, and within twenty-four hours I began to improve, and went on to a rapid recovery."

I saw the doctor on October 13, 1898. His history showed that he had had intermittent fever more than once. After a severe attack of vertigo followed by nausea and vomiting, he found himself very deaf on one side with his hearing greatly impaired on the other. This was on October 3. He had been in bed for a few days on account of the vertigo and nausea. His hearing was still impaired. As tested by a watch on the right side, it was 5-120, on the left, 20-120. *The aerial condition was better than the osseous on each side.* The membrana tympani looked convex. Inflation by Politzer's method had been practiced by a colleague without benefit.

From the history and the objective conditions, I have no doubt that we were dealing with a malarial affection of the acoustic nerve itself, or of the central apparatus, and not with an idiopathic affection of these parts (Menière's disease). Certainly it was not a tympanic affection. I accordingly urged the administration of quinine with the result just noted. This was in accordance with the patient's own opinion, and he is a man of large experience in malarial as well as in general diseases.

I report these cases, because the very proper dread of giving quinine in diseases of the ear, is sometimes excessive, in that it prevents an impartial consideration of symptoms, which may be due to malaria. I do not think there is any very great difficulty in the way of making the diagnosis, if the physician is on the alert. But, I fear that the inordinate disposition to operate, in every case of high temperature, in aural disease, or to extend or repeat an operation already begun, sometimes leads to the most untoward results. Quinine is just as valuable in aural symptoms, dependent upon malaria, it is hardly necessary to say, as those coming from any other part of the body. It is not difficult to distinguish a septic rise of temperature, with its irregular, vacillating curve, from that of pronounced, intermittent fever, which rapidly reaches its height, and as rapidly descends. This may seem very elementary teaching, but, from what I see in practice, it is sometimes necessary.

NEW YORK, March 25, 1899.

CASE OF PYO-PNEUMOTHORAX TREATED BY ESTLANDER'S OPERATION.

BY JAMES P. KIMBALL, M.D.

Major and Surgeon U. S. A., Governor's Island, New York.

Private H. P., 13th U. S. Infantry, received a gunshot wound, July 1, 1898, in action near Santiago de Cuba.

The missile, a Mauser bullet, entered the outer surface of the left arm, passed through the biceps muscle near its center, and escaped from the inner surface of arm, then entered left side of thorax, fracturing the fourth rib in the axillary line, perforated both lungs, and escaped from right side of thorax between the fourth and fifth ribs in the post axillary line.

The flesh wound of the arm healed by first intention, as did the wound of exit from chest. The wound of entrance, with fracture of rib on left side of the chest, was followed by pyo-pneumothorax of left pleural cavity. A drainage opening was made in front, July 6, and a second one, July 28, below the angle of the scapula. The lung became totally collapsed, leaving a large cavity which held thirty-eight ounces of fluid. On August 26 Estlander's operation for obliteration of the cavity was performed. An incision was made from left nipple downward to tenth rib and back to fourth dorsal vertebra, a flap raised, and the fourth, fifth, sixth and seventh ribs resected. The cavity was subsequently irrigated every other day with a hot saline solution and a dry dressing applied. The cavity has gradually contracted and at date of photograph, February 19, 1899, there remains a cavity, or rather a sinus, with its opening in the axillary line just above eighth rib, which holds barely an ounce of fluid. There is conspicuous deformity of the chest. The soldier appears in good condition, but suffers from marked dyspnea on exertion.



SPRAINS AND THEIR TREATMENT.*

*Read before the Hampden County Medical Society, December 7, 1898.

BY CARL A. ALLEN, M.D., Holyoke, Mass.

Mr. President and Fellows of the Hampden County Medical Society:

It is well for us, at times, to withdraw our minds from the consideration of the more serious lesions of the body in which a human life may depend upon a moment's work at our hands, and to discuss some of those minor ills to which flesh is heir. In view of this fact, I invite your attention this evening to a brief discussion of one of the most common accidents the surgeon meets, namely, sprains, with special reference to their treatment.

One of the best definitions of a sprain with which I am familiar is that given by Busch in Ziemssen's Handbook of General Therapeutics, and is as follows: "A sprain is the forced excursion of a joint beyond its normal limit of movement. As a result, the articular surfaces on the side towards which the movement takes place are pressed together, and a point of contact formed which serves as the fulcrum for the lever which forces apart the opposite portions of the articular surfaces. In consequence of the gap formed by this separation a vacuum tends to form within the joint. This is prevented by the soft peri-articular tissues being forced in by atmospheric pressure. At the same time, the tendons and ligaments are violently extended and may be torn. When the force is removed, the articular surfaces instantly approximate and occasionally include folds of synovial membrane between them, or displace the inter-articular cartilages, when present. Sheaths of tendons may be ruptured and the tendons spring out of place and over some bony prominence." Nerves as well as muscles and tendons are stretched and may be lacerated. If the accident is the result of external violence, the articular surfaces, being brought violently together, suffer a considerable degree of contusion, greatly aggravating the case. Sometimes small portions of cartilage are chipped off or partly separated from their attachments. In all cases there is considerable infiltration of blood and serum into the tissues around the joint.

Falls, blows, and twists attended with rotation of the articulating surfaces or a movement of these surfaces in opposite directions are the most common causes.

The joints most liable to sprains are the ginglymoid or hinge joints, and in order of frequency, perhaps, the wrist and fingers, ankle, knee and elbow.

SYMPTOMS: Immediately following a wrench, twist or turning of a joint, there is sudden occurrence of pain in the affected joint, impairment, if not total loss, of motion and a sense of faintness or sickness owing to the shock the system has sustained, which is sometimes severe. Swelling, with more or less discoloration, speedily follows. The pain is often extremely severe, and quite overpowering for a time.

The **DIAGNOSIS** should not be difficult, and yet both fractures and dislocations have been mistaken for sprains. In sprains there should be no deformity unless tendons are misplaced, and early mobility of the joint is never entirely lost as in dislocation. The history of the lesion, the shape and mobility of the joint and a comparison of the length of the limbs will differentiate between sprain and dislocation, while the greater mobility, crepitation, deformity and shortening are symptoms belonging to fracture rather than sprain. A careful examination should always be made, with extension of the limb, and, if necessary, under anaesthesia, so that misplaced tendons or other deformities can be corrected.

The **PROGNOSIS** of recent sprains is always good, and even in old and neglected cases most hopeful encouragement should be given.

TREATMENT: The first indication is to relieve the pain and shock and to check inflammatory action, afterwards to restore the joint to its normal function as *speedily* as possible.

Twenty-five years ago, when I was fresh from college halls with an M.D. attached to my name, the treatment of sprains was something like this: Bandage the injured limb, then elevate it and place in an easy position with splints, wire case or wooden box to insure quietude and support. Use hot or cold applications medicated with lead and opium, etc., to reduce inflammation, and then, after the acute symptoms have subsided, use liniments, sorbefacients and passive motion to restore the joint to its normal usefulness, which often required several weeks.

The treatment of to-day, which has given the best results, and which has the sanction of such authorities as Seé, Nélaton, Demarquay, Roux, Graham and scores of others, may be summed up in one word, "*massage*."

Perhaps I can best illustrate the mode of treatment indicated by describing, in detail, one of several cases which have recently occurred in my own practice, in which the success of the treatment has been uniformly satisfactory.

CASE: J. G. B., merchant, aged about 65, rather robust in stature, was thrown from his bicycle, severely spraining his left ankle. Although the pain was excruciating, he managed to hobble a few rods to his own home and I was summoned.

He was lying on a couch, suffering intense pain, which he described as making him sick and faint. Having removed his shoe and stocking and satisfied myself that it was a case of simple sprain without complications, I ordered a large pan filled with water, as hot as could be borne, and placed the injured foot and ankle within it. By frequently removing portions of the water and adding more hot water, I kept the temperature as nearly 125° F. as possible, and continued the bath for about one-half hour. I wish to emphasize the importance of keeping the water *hot* and continuing it for half an hour, although twenty minutes might answer in mild cases. Within a few minutes after placing the injured joint in the hot water the pain began to subside and was practically all gone long before the bath was finished.

Having finished the hot bath, the foot and ankle were carefully bandaged with a flannel roller and the patient put to bed. He passed a fairly comfortable night, not complaining of pain except when he moved the injured joint.

On visiting him the next day, about twelve hours after the accident, I found him with foot, ankle and leg much swollen and discolored on the outer side where the greatest tension had been. Having freely anointed the swollen parts with vaseline, I commenced the massage as follows, using the stroking movement chiefly: Placing the balls of three fingers on top of foot near the toes, I carried them slowly up the foot, over the ankle and leg a little above the highest point of the swelling, removing the fingers and returning to the place of starting, the manœuvre was repeated. This movement was repeated and continued over every part of the limb wherever swollen. At first the pressure was very light over the inflamed parts, but gradually increased, until, before the séance was completed, I was using all the pressure my tired fingers would allow. At first he would cringe and use a few gentle words of remonstrance as the fingers passed over the most tender parts of the joint, but, by graduating the pressure according to his spirit of endurance, he soon ceased to complain, and before the sitting was over I could press nearly as hard over the joint as anywhere else, without pain or inconvenience.

After a little, the ball of the thumb is brought in to aid the fingers on opposite sides of the limb, and later the whole hand. The motions I use are nearly uniform, continuous stroking and friction,

commencing with a very light touch and increasing gradually in force until the effused serum could be felt slipping up the leg in front of thumb and fingers.

Towards the end of the sitting decrease the force, using more and more the surface of the whole hand, which leaves a soothing effect. I continued the first sitting about forty minutes, but an hour would have been better if a regular masseur had been employed. The leg was again bandaged and he was told that he might try his weight on it the next day. The following day my patient could bear some weight on his foot, was free from pain and feeling good.

The swollen parts were much softer and the ankle much less tender than the day before. I repeated the massage for nearly an hour, varying the movements somewhat, and commenced motion of the joint itself. Bandaging again, I advised a pair of crutches and told him to use his ankle as much as he could without hurting. The next morning I found him walking the floor with one cane, as he found he could go without pain in the joint, and he did not see the use of crutches. The swelling was much reduced, the joint but slightly tender and considerable motion could be given the joint without pain.

Another thirty minutes of massage and motion of the joint, and again the bandage was applied. The treatment was repeated daily for five days, and on the sixth day he walked to the car with a cane, and went down to his store, where he remained half a day, and afterwards attended to his business as usual. He limped a little for a few days and then threw away his cane and was as well as ever.

The improvement is marvelous when we compare results with the older method. Graham has analyzed the results of 308 cases of sprains treated by massage, by himself and several independent observers in Europe, representing all grades of severity and all varieties of injuries of this nature. He finds the average length of time for recovery to have been 9.1 days, while the average of fifty-five cases treated by the same observers in the usual manner of fixation, showed the average time for recovery to be 26.16 days, or nearly three times as long. It is safe to say that if a sprain is treated by massage early, and two treatments given each day by a capable masseur, the time required for perfect recovery will be in relation to that by fixation as one to four, or a week to a month.

In the case of old and neglected sprains, hot daily baths for the affected joints, followed by massage, will give better results than any other method, and should be faithfully tried.

In my own cases I have never given the injured joint but one treatment each day, and have preferred to do it myself, but where a

skilled masseur can be obtained it would be better, without doubt, to give two treatments daily. However, experienced masseurs cannot always be had, and it is better for the surgeon himself to give his personal attention to the matter than to risk his patient in the hands of an incapable attendant. I have seldom found it necessary to give opiates, but in cases of great severity with considerable contusion of the articulating surfaces it may be advisable. As a rule, however, the hot water bath will be found sufficient.

The massage treatment is both rational and scientific. You have an injured joint with the surrounding tissues infiltrated with serum and more or less blood, which the bruised and broken vessels are endeavoring to absorb. In massage you crowd the serum out of the bruised area into one with healthy blood and absorbent vessels, where it is rapidly taken up and carried into the general circulation. You thus relieve nature of its greatest burden and place the injured tissues in the best possible condition for speedy repair.

Within the past few months the "Hot Air Treatment," so-called, has won many enthusiastic supporters in the treatment of nearly all forms of joint disease, including sprains. I have never tried it, but the theory of exposing a swollen and inflamed joint to a temperature of from 250 to 400 degrees, by means of which the circulation in the part is greatly increased and the absorption of effused fluids also aided by profuse diaphoresis, seems rational, and I hope to give the method a trial in the near future.

I am aware, gentlemen, that you will find nothing new in these suggestions, as the massage treatment of joint disease has been extensively used both in this country and in Europe for several years, but we owe it to each other to give frequent interchange of opinions on all subjects, both small and great, relating to our profession, and I hope, in the present case, that you will point out all the defects and suggest all the improvements possible in the treatment of these lesions, so that, one and all, we may know the best way, and, knowing it, go forth and practice it.

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SCHOOL Hygiene was the subject of Dr. C. S. Rodman's address at the New Haven County meeting of the Connecticut Medical Society, held in New Haven, in October, 1897. The closing recommendation, which was published in the YALE MEDICAL JOURNAL for December, 1897, was for the examination of the eyes of the school children and the instruction of teachers and school principals in the routine of such examination. At the last annual meeting of the State's Society in May, 1898, resolutions were received and adopted from the New Haven County Association to effect, that "The State of Connecticut should, through its Legislature, provide for a simple test examination of every pupil's eyes in that division of the primary department where the children are first able to read, the teachers of these departments being provided with test cards for making the examinations themselves. The teacher should then make a report of each examination on a blank provided for that purpose, which should be filed with the principal, the latter notifying the parent or guardian of a child with defective eyes, that it is advisable for the child's health to consult their family physician for recommendation to some oculist." The matter was referred to the

Committee on Legislation with power to act. This Committee met in Hartford on December 7, and voted to attempt no change in the Medical Practice Act. All proposed legislation was laid aside excepting that of test examinations for children's eyes in the public schools. The preparation and introduction of the necessary legislation was referred to a Sub-Committee, consisting of Dr. C. S. Rodman as Chairman, Dr. R. S. Goodwin and Dr. N. E. Wordin, the last two members of the State Board of Health, and all three officers, past or present, of the State Society. The Special Committee at once sought the aid of Col. L. F. Burpee, and the advice of Secretary Hine, of the State Board of Education. In accordance with the views of the Committee and the suggestions of Secretary Hine, Colonel Burpee drafted the proposed law which was introduced by Mr. H. R. Durant on February 10. On March 1, a hearing was held at the Capitol before the Committee on Public Health and Safety, at which hearing the following appeared and spoke in its favor, viz.: Colonel Burpee, Dr. Storrs (Ex-President), and Dr. Stearns (President), of Hartford; Dr. Osborne (President New Haven County Association), and also School Superintendent Kendall, of New Haven; Judge Cowell and Superintendent Tinker, of Waterbury, in addition to the members of the Society's Sub-Committee, Drs. Rodman, Goodwin and Wordin. No one appeared in opposition and the Legislative Committee, after attentively listening to the ten lawyers, educators, and physicians, who had advocated the proposed law, were graciously disposed to remain and further question and discuss the matter, which they favorably reported to the General Assembly, the bill being placed upon the calendar on March 8. An editorial of the *YALE MEDICAL JOURNAL*, of December, 1898, together with the favorable comments of various State papers, were sent to every member of the General Assembly, and also a "brief" or terse explanation of the provisions of the bill. Similar clippings and a copy of the bill itself was sent to members of the Society in every town of the State, and their coöperation was asked. The Committee and the Society are under especial obligation to Colonel Burpee, who drafted the bill, went to Hartford with the Chairman and submitted the matter to Secretary Hine, afterwards attending the hearing, where he advocated the enactment and extended every possible courtesy to the Committee and their friends. In medical legislation, Connecticut has heretofore followed, and not always improved upon precedents elsewhere established. While an increasing number of cities and Health Boards like that of New York (whose jurisdiction does not extend to the larger cities), have, without special legislation or appropriation, in-

stituted examinations of the eyesight of children under their supervision, we believe that our own will be the first State to enact a law for this purpose, and to place its enforcement in the hands of its salaried officers. In this regard the legislation advocated by the Connecticut Medical Society is especially creditable to the Society and to Connecticut. The JOURNAL takes great pleasure in congratulating the State Society upon the successful termination which has crowned its efforts. It is a source of satisfaction to us to know that the editorial, recommending the testing of the eyesight of pupils in the public schools, which appeared in the December number of the JOURNAL, was referred to every member of the General Assembly of the State of Connecticut.

* * * *

CERTAINLY one of the greatest, if not indeed, the greatest advance made in the field of medicine during the past year, was the general interest in the spread of tuberculosis, and the examination of means suggested for its prevention. Medical journals and societies have discussed the question in nearly every issue or meeting, and the result is that the public is opening its eyes to the fact that not guarded against, the tubercular bacillus is an enemy more to be dreaded than leprosy or typhoid fever, and also is beginning to see that, when properly treated, the disease does not necessarily result fatally, but can be cured. The physician has learned that it is unnecessary to compel the patient to change his residence to some distant resort for consumptives, in order to benefit him, but that almost any place where pure air and sunshine can be had in plenty may be used to give him relief. The air of Massachusetts would have been about the last to be recommended to a consumptive patient, yet the physicians of the hospital recently established there say, "The remarkable change in the aspect of these patients after even a short stay at the hospital, would convince the most casual observer of the efficacy of the treatment upon the general condition of the patient." The results in European Sanatoria, which have been longer established, are most encouraging. Many patients who have gone as a last resort to Dr. Walther's noted institution at Baden, have left entirely cured, and after some years have had no return of the disease. In England great interest has been taken in the subject. Several public hospitals for consumptives have been opened, a society has been organized under the patronage of the Prince of Wales for studying the means of preventing the spread of the disease, and the Weber-Parke Prize of the College of Physicians of London will be awarded next year to the writer of the

best article based on original investigations of the subject of "The Etiology of Human Tuberculosis and the Assistance which a Knowledge of the Etiology may Render to the Task of Prevention."

In this country practical results of the investigation of the disease are just beginning to appear. Measures are being taken to prevent the spread of tuberculosis, notably in factories. Massachusetts has opened (October 3, 1898) the first State Hospital for Consumptives (not incurables). It is on the pavilion plan and accommodates two hundred beds. The Legislatures of New York and other states are discussing the establishment of state hospitals. The present year, therefore, seems almost certain to bring forth great advances, here as well as abroad, in the means of preventing the disease and in the care of those afflicted with it.

MEDICAL SOCIETY REPORTS.

THE NEW HAVEN MEDICAL SOCIETY met at the home of Dr. Arnold, Wednesday evening, March 1. The President, Dr. F. W. Wright, presided.

Dr. Swain presented two large pieces of the third or pharyngeal tonsil removed from adults by the adenotome. They were remarked upon by Dr. Eliot.

Dr. Springer related the case of a boy 11 years old, who, while engaged in calisthenic exercises, fell forward on his hand. There was considerable pain, followed the next day by decided swelling. No crepitation could be detected, nor could increased or abnormal mobility. A skiagraph was taken, and a transverse impacted fracture of the radius an inch from its lower end was plainly shown. Pressure over this spot caused severe pain, but even now no crepitation could be obtained. The case was discussed by Drs. Swain and Tuttle.

Dr. H. E. Smith showed a skiagraph of the jaw of a child 12 years old, in which the eruption of an upper incisor tooth of the temporary set was delayed. The deciduous tooth was still firm. The skiagraph showed the permanent incisor tooth above the other very plainly.

Dr. C. S. White related the case of a woman, who, having suffered for six years from muscular rheumatism of the right biceps, and having taken all the usual drugs without relief, was cured by the exhibition of two 5 grain doses of salophen. The case was discussed by Drs. Eliot and Bellosa.

Dr. Arnold then read the paper of the evening, entitled "Scoliosis and its Treatment." The paper was followed by a demonstration of the apparatus used in correcting scoliosis. The subject was discussed by Drs. Swain and Tuttle.

The Question Committee reported that a paper might be expected at the next meeting by Dr. Sullivan, entitled "The Treatment of Gonorrhoea and its Complications." The Society gave a vote of thanks to Dr. Arnold.

THE NEW HAVEN MEDICAL SOCIETY held its regular meeting on Wednesday evening, March 15, 1899. The President, Dr. F. W. Wright, occupied the chair.

Dr. Wright stated that he had engaged to disinfect "Springside Cottage" after the small-pox cases, a man who had had small-pox when quite young, about 34 years ago. He was vaccinated, however, at this time, and there resulted a most typical primary vaccination mark. The case was remarked upon by Drs. Swain and Eliot.

Next came the reading of the paper of the evening by Dr. Sullivan, entitled "The Treatment of Gonorrhoea and its Complications." The paper was discussed by Drs. Daggett, Swain, Springer, Arnold and McDonnell.

The Prudential Committee recommended for election to membership, the following: Drs. Butler, Oertel, Nadler, Robins, Briggs and Hinckley. In accordance with the rules, the names were laid over till the next meeting.

Dr. Swain moved that the rules of the Society regarding the introduction of miscellaneous business be laid aside and allow Dr. Wilson, of Hartford, to bring before the Society an obnoxious bill. It was so voted. Dr. Wilson stated that during the past week a bill had been brought before the State Legislature requiring that every physician be compelled to register in the town in which he located. Dr. Wilson was present at the hearing and opposed the bill. A Dr. Barboury was also present, and while he opposed the bill, he incidentally offered to amend the same. It is not known whom he represented.

It was moved and unanimously voted that the President and Secretary draw up a set of resolutions embodying the sentiments of the New Haven Medical Association as disapproving of the passage of said bill before the Legislature, and the Secretary was instructed to send copies to the Representatives and Committee on State Legislation.

The Question Committee reported that a paper by Dr. E. McCabe, entitled "Eye Strain," might be expected at the next meeting.

The annual meeting of the NEW HAVEN COUNTY MEDICAL ASSOCIATION will be held in New Haven April 20, at 10.45 a. m. The question for discussion will be "Albuminuria." The committee to report on the question, H. E. Smith, on Functional Albuminuria; J. D. McGaughey, on Puerperal Albuminuria; C. A. Tuttle, on the Prognostic Value of Albumen in Chronic Nephritis, and C. S. Rodman, on Albuminuria in Life Insurance. The Dissertators will be E. W. Smith, T. M. Cahill, and R. E. Peck.

MEDICAL PROGRESS.

THE PHYSICIAN'S CODE OF ETHICS NOT NARROW OR ANTIQUATED.—*Abstract of the Inaugural Address of the President of the New York County Medical Association, Dr. Frederick Holme Wiggin, delivered February 20, 1899.* On the occasion of the installation of the officers of the New York County Medical Association, which took place at the Mott Memorial Hall, New York city, on the evening of February 20, 1899, the newly elected president, Dr. Frederick Holme Wiggin, in his inaugural address, embraced the opportunity to enlighten both physicians and the laity more fully regarding certain portions of the National Code of Medical Ethics, about which there seemed to be much misapprehension. He began by disavowing the slightest intention of stirring up old strifes, and claimed that he had selected this special topic solely because, in his intercourse, not only with his professional brethren, but with various men of affairs, he had been impressed with the fact that certain very important parts of this subject were very generally misunderstood. For instance, only a few months ago a high official in the Homeopathic State Medical Society had told him that when the American Medical Association, and its affiliated societies, were ready to open their doors to those who held different views from the majority as to the action and dosage of drugs, he, for one, would be willing to leave his organization, discard his sectarian title and apply for membership. This gentleman, like many others, was not aware that years ago the American Medical Association had taken this very position.

In spite of all that had been said since regarding the code of medical ethics, the members of the medical profession in this country had lived under it in reasonable harmony from the organization of the American Medical Association in 1848 until 1882. In the latter year the first note of discord had been struck by the New York State Medical Society which, at its annual meeting in Albany, had adopted a different code. As this was in direct violation of one of the by-laws of the national organization, the judicial council of the latter society, by a unanimous vote, excluded the New York delegation. As a result, the members of the profession residing in this State who still desired representation in the national body were constrained to organize the New York State, and the New York County Medical Associations. This division of the profession, with its resulting dissensions, was especially unfortunate because it arose from a misunderstanding, and was, therefore, wholly unnecessary. The

American Medical Association had endeavored to clear up any doubt upon the main question at issue, that of consultations with homeopathic practitioners, by adopting in May, 1884, a series of resolutions, making clear the fact that the national code contained no provision in any wise inconsistent with the broadest dictates of humanity and the exercise of the most perfect liberty of individual opinion and practice, and that the true ground for declining professional fellowship with any class of practitioners was not a belief in any particular dogma, but the adoption of sectarian names as trade-marks, and the formation of organizations antagonistic to the great mass of the medical profession. This action of the national body, Dr. Wiggin said, had certainly opened the door years ago for the return to the parent organization of the members of the New York State and County Societies, and that the members of the County Society now appreciated this fact and occupied identically the same position, was evident from the inaugural address, in 1897, of its president, Dr. Arthur M. Jacobus, who, in speaking of certain sectarian practitioners, said: "If they will but drop the sectarian title for that of physician, pure and simple, and let the old and new school questions die out, I am sure we will welcome them with open arms."

In closing his address, Dr. Wiggin said that although the local profession might be compelled to wander a few years longer in the desert of disorganization, it was fair to predict that early in the twentieth century a Moses would be found who would lead the profession into the promised land of union and strength. When that gladsome time should arrive when all educated physicians in this State would join hands, he hoped the larger and reorganized society would adopt, as its motto, a paraphrase of that of the famous Musketeers of Dumas—"The profession for the individual practitioner, and the individual practitioner for the profession."

THE CLINICAL EFFECT OF THYROID EXTRACT ON FIBROIDS OF THE UTERUS.—(*Medical News*, Jan. 14.) Dr. William Polk gives the histories of ten cases treated by this method. In each case there was an improvement, the greatest existing in the cases which took the treatment longest. Its manifestations were: (a) control of the menstrual flow; (b) arrest of the growth and, in some cases, diminution of the size of the tumor and apparent softening of it; (c) disappearance of pain and diminution of tenderness in the growths; (d) betterment of general nutrition, manifested by a return of flesh, improved state of the skin, hair and nails, and the substitution of a good color for the appearance of anæmia. One drawback, however, was more or

less gastric disturbance. In one case treatment had to be abandoned on this account. In every instance tachycardia was the most common drawback, next, restlessness and sleeplessness, when the drug was taken at bed-time, and, lastly, indigestion. Of late Dr. Polk has been combining arsenic and extract of the thymus gland as a means of controlling thyroidism, but too little time has elapsed to warrant any conclusive statements. Fowler's solution is used, three drops three times a day, and the thymus extract in doses just double that of the thyroid, the three agents being given simultaneously. Contraindications are arterial fibrosis and cardiac renal diseases. In regard to the nature of its action very little is known. Dr. Polk draws an analogy from myxedema. Both diseases are common to women and common at about the same period, both are characterized largely by an increase of the connective-tissue elements, and both are prone to uterine bleedings. This similarity is too general to be more than suggestive, particularly when offset by the dominating influence of the ovary, whose removal generally determines the subsidence of the fibro-uterine disease. But in the absence of any contraindication the analogy may be taken as a justification for the prolonged use of thyroid extract in this disease, with the proviso that we be keenly alert as to the state of the circulatory, renal, nervous and digestive systems, stopping or curtailing treatment as warnings arise.

INFECTION FROM THE HANDS OF TUBERCULOUS PERSONS.—Dr. Baldwin (*Philadelphia Medical Journal*) writes under this title, and, while conceding that the danger from a few tubercle bacilli on the fingers is slight, draws attention to the scant mention of this mode of infection in literature. Wishing to determine the difference in respect to the bacilli present on the hands of tuberculous patients who used handkerchiefs for the reception of sputa and those using cuspidores or cloths, he made a series of experiments in which he washed the fingers of twenty-eight persons known to have tubercle bacilli in their sputa. Ten of these were private patients, of whom half used handkerchiefs and the other half used cuspidores or occasionally cloths, the others were patients in a sanitarium and used cuspidores only. The washings from the ten private patients and from five of the others were used to inoculate guinea-pigs, two of which were taken for each case. In eight of the ten private cases, one or both of the guinea-pigs became tuberculous. The other two cases were negative, but both these cases were scrupulously careful to keep their hands cleaned. In two of the five sanitarium cases one pig in each case was found tuberculous. The

washings from the other thirteen were centrifugated and examined microscopically, and in three of the sediments the bacillus was found. In conclusion he submits the following points: 1. Living tubercle bacilli are not infrequently present on the hands of patients who are not careful in the use of handkerchiefs, cloths or even cuspidores where expectoration is abundant. 2. No precautions against contamination of the hands can avail better than the use of cuspidores and frequent washings with soap and water. 3. With the present usage of society people are not liable to use pocket cuspidores except in institutions, consequently handkerchiefs will be used in public, especially as anti-spitting laws are forcing individuals to use them. There is, therefore, urgent necessity for a cheap, comparatively impervious and soft handkerchief that can be burned.

HOSPITAL AND CLINIC NOTES.

SPONTANEOUS DISLOCATION OF THE WRIST JOINT.—Mr. W—, a farmer, recently entered the Hartford Hospital, suffering from stricture of the oesophagus. The patient is 62 years old, about 5 feet in height, weighs 92 pounds, and is of a particularly strong, but nervous constitution. He had been unable to eat anything for three days previous to his entrance, but had walked in, and was able to answer all questions regarding himself. He appeared to be in fairly good physical condition. Rectal alimentation was begun and the patient was soon up and about the ward. In addition the patient presented the peculiar dislocation shown in the accompanying cuts, the etiology of which is as follows: He served as a private in the Civil War and was shot in the lower part of the right forearm in the battle of Petersburg, Virginia, in June, 1864. The wound was treated on the battlefield, being probed and small pieces of bone removed. It was not closed, but left open to secure drainage. Four months later the patient was removed to the hospital on Davitt's Island. At this time a linear incision, four inches long, was made on the back of the forearm, starting from a point two inches from the wrist joint. The lower part of the radius was found to be necrosed and the lower four inches of same was excised, the ulnar, being healthy, was not disturbed. The forearm was dressed and splints running to the finger tips were applied. These were gradually shortened and about the fifth week, while the patient was shuffling cards, he first noticed the deformity. At this time it was less apparent than at present, and the surgeon in charge regarded



it lightly. He was discharged about the ninth week with more or less false ankylosis. During the last 18 years the dislocation has been about the same as at present. There is loss of abduction and adduction of the thumb, as well as flexion of the proximal phalanges. The flexor profundus digitorum fails to contract. Aside from these the action of the other muscles of the hand seem to be unimpaired. The patient has a marvelous grip. When the flexors are contracted the hand is at right angles with the ulnar. The radial group of muscles pass around over the ulnar as shown in figure No. 1, in the position of supination, which is accomplished by flapping the hand over (there being no power to supinate properly). The head of the ulnar is held simply by the skin and annular ligament, and is constantly striking against objects, being therefore rarely free from abrasions. By gripping the hand and applying traction it can be put back in its proper relation with the ulnar.

CÆSAREAN SECTION WITH FATAL PULMONARY EMBOLISM ON THE TWELFTH DAY.—*William F. Verdi, M.D.* On the evening of February 3, 1899, I was asked by Dr. William Sheehan of this city to see with him Mrs. M. N., an Irish woman, who had been in unsuccessful labor some 18 hours. She was 29 years old, had been in this country 9 years and was married 10 months. Her first menstruation had occurred at the age of 16 years. Since then she had menstruated regularly up to the time of her marriage, when, probably owing to the excitement attended with such functions, it was retarded until 2 weeks after the marriage. The amount of menstrual flow had always been considerable, but never excessive. The menstrual cycle lasted about 5 or 6 days, with little or no pain. She had never noticed any leucorrhœa.

Shortly after the appearance of her retarded menstruation she became pregnant. During the first 3 months of this pregnancy she suffered a little from morning sickness, never severe enough to consult a physician.

At about the fifth month the patient felt quickening and has experienced it up to the present time.

The pains had begun about 3 a. m., on February 2, and had continued all day of February 3, being very light in character. Soon after the beginning of the pains there appeared, coming from the vagina, a dark tenacious discharge, which was found to be meconium. On vaginal examination Dr. Sheehan detected the presence of a large tumor in the pelvis, posterior to the cervix uteri, making normal delivery apparently impossible.

I found the patient to be a large, healthy looking woman of about 30 years, complaining of periodic pains in her abdomen which had continued all day without any increase in severity. The pulse was 90, full and strong, temperature normal. Abdominal inspection showed a large elongated tumor, about the size of a full term pregnancy, lying diagonally across the abdomen and projecting prominently above the symphysis. On palpation, the tumor was found to contain a foetus, the breech presenting, head at fundus, face to back and right. The movements of the child could be distinctly felt. Vaginal examinations showed the vulva slightly oedematus, the vaginal walls smooth. Just inside the introitus a large tumor could be felt which was quite tender, immovable, dense and smooth. It almost completely filled the true pelvis save a small space anteriorly which allowed the passage of the index finger to the cervix uteri. The cervix was found high up above the symphysis and dilated to about the size of a 25 cent piece. The breech of the child was felt presenting. On removing the finger it was found to be covered with blood and meconium, showing that the membranes had ruptured and the waters escaped. Realizing that the child could not be born through so small a conjugate, I advised to chloroform the patient and to puncture the tumor. If it proved to be cystic it could be evacuated, and the child be born "per vias naturales." At the same time all preparations should be made for Cæsarean section in case the tumor was solid.

This was promptly carried out. In deep chloroform narcosis the tumor showed its solid consistency and section therefore followed without delay.

An incision was made in the linea alba, the uterus lifted out of the abdomen and held by an assistant, with firm pressure around the cervix. A longitudinal incision was made through the anterior surface of the uterus, beginning at the fundus. The child and the placenta, which was found to be adherent to the fundus, were both quickly removed and handed to the nurse. The operation was then finished by removing the fibroid tumor, which was done with considerable difficulty owing to the firm adhesions. It weighed 1 3-4 pounds. Two other small tumors about the size of a hen's egg were also removed from the body of the uterus. The time consumed from the time the patient was put on the operating table to the time she was taken back to bed was 45 minutes (12.30 a. m. to 1.15 a. m.)

The patient made a good recovery from the operation and passed through a good convalescence, the wound healing by first intention. The sutures were removed on the sixth day. On the

subsequent day the nurse was dismissed. This very satisfactory progress continued, with the exception of a persistent high pulse rate, 100 to 120. On the twelfth day she started to make free motions in her bed, remarking to the husband that she never felt any better. On the same evening she went to sleep about 9 o'clock, sleeping soundly until shortly before midnight, when she awoke, calling her husband in great anxiety, complaining of severe præcordial pain and a feeling of suffocation. The husband hastened for Dr. Sheehan, who arrived just in time to witness the patient's exitus. The child is now living and healthy, weighs 8 pounds.

This case is of particular interest on account of its ultimate fatal outcome. Unquestionably, though no autopsy was obtained, the cause of death was pulmonary embolism. The high pulse rate was probably caused by a thrombus, a condition to which Mahler attaches a great deal of importance as a diagnostic sign. It shows well that the danger of an operation does not cease with the healing of the wound, and the ultimate results depend not solely upon the success of the operation itself.

It is noteworthy that these cases of pulmonary embolism, which are more frequent in obstetrical and gynecological practice, frequently occur considerable time after the operation and during apparently perfect convalescence.

A similar case following an operation for removal of a papillomatous ovarian cyst with death on the fourteenth day, is reported by Kelly (*Operative Gynecology*, Vol. II, 1898, page 129), where a full discussion of this subject may be found. See also Olshausen, especially in Ruge's *Festschrift: Ueber toetliche Lungen embolie*.

COLLAPSE IN A PATIENT WITH ACUTE DYSENTERY.—The patient was a soldier of about 22 years old, of good habits. There was no previous history, except of a slight diarrhoea, which had persisted for several weeks. On the 20th of November last, the patient had several loose movements of the bowels, and at this time he first noticed that he passed a small quantity of blood. Up to this time he had been performing his regular duties. During the evening of this same day he was taken with severe cramping pains in the abdomen and movements became more profuse and bloody. He grew rapidly weaker and spent nearly the whole night in the closet. About five o'clock in the morning he was found by another soldier, and was so weak he could not walk or speak above a whisper. Four soldiers carried him immediately to the field hospital, where the surgeon first

saw him. At that time no radial pulse could be found, the heart's action was exceedingly rapid and very weak; respiration was long and sighing, extremities were cold, eyes sunken and glassy, and forehead covered with a cold, clammy perspiration. He was very restless, yawned frequently, and had every appearance of having lost a large quantity of blood. The greatest source of discomfort seemed to be severe muscular cramps in the legs.

He was at once surrounded with hot water bottles and covered with warm blankets. Friction was applied to the legs, and 1-15 of a grain of strychnine given hypodermatically. The radial pulse became just perceptible, but soon began to fail again. As there was absolutely nothing to make an infusion with, hypodermoclysis was resorted to with very little hopes of its proving beneficial. An approximately normal saline solution was made up and nearly a quart injected under the skin of the thighs and buttocks with a large anti-toxine syringe. The improvement in the pulse and general condition was rapid, and in a short time hot milk was taken by mouth. From this time on the man slowly but surely improved, and was ultimately discharged from the hospital.

The most noticeable feature of the case was the sudden collapse, with all the symptoms of an acute hemorrhage.

ITEMS OF INTEREST.

The name of the New York Cancer Hospital has been changed to the General Memorial Hospital.

Connecticut's Medical Law.—The three medical examining boards agree that the candidates must answer correctly 75 per cent. of the questions. This year 40 per cent. of candidates failed to pass.

A specimen of the new element, argon, was solidified recently by means of liquid air at a temperature of more than 200° below zero.

The International Medical Congress will convene August 2, 1900, in Paris. The session will last seven days. While French, naturally, is the official language, English and German will be permitted.

The formal opening of the new hospital building of the Massachusetts Charitable Eye and Ear Infirmary took place Thursday, March 9.

A report from a Cuban physician residing at Sagua La Grande states that over forty per cent. of the male population of that place are affected with venereal disease.

Brandis has collected ten cases of syphilis in physicians, all infected professionally in the fingers, and all extremely violent cases, yielding to only prolonged and repeated treatment. The diagnosis was made very late in each case.

The Vienna Medical Club has voted the sum of three hundred golden crowns for the establishment of a prize in memory of Dr. Herman Franz Müller, who recently died of plague, contracted in the bacteriological laboratory of Vienna.

The patient upon whom Dr. Maurice H. Richardson performed gastrectomy died recently with a complete stenosis of the colon at the splenic flexure. The operation was performed last June and the first symptoms of obstruction occurred about the middle of last November.

The new surgical amphitheatre of the Boston City Hospital was opened on February 15, and the first public operations took place on February 24. This hospital is one of the finest municipal hospitals in the world, rivalling the costly private endowed hospitals of New York city. It contains 732 beds and five aseptic operating rooms, besides the new amphitheatre.

The medical authorities of Great Britain are much alarmed over the enormous increase of cancer in that country. A recently prepared table of statistics shows that while in 1840 the proportion of deaths from cancer to the total death rate was only one to 129, it has steadily increased, and in 1896 was one to every 22 of the total death rate.

The president of the English Anti-Vaccination League has given notice of an international anti-vaccination congress, to be held in June. The German League has petitioned the Reichstag for the abolition of compulsory vaccination in Germany, but, fortunately, with not the slightest chance of success. The *British Medical Journal* remarks that one of the apostles of the movement has just completed a two months' tour of the United States for the purpose of conferring with the leaders of the lunacy in America.

General Infection with the Gonococcus.—Columbine reports a case of gonorrhoea which was complicated with bubo, and with suppurative epididymitis and parotitis. The gonococcus was found,

unaccompanied by any other bacteria, in all three of these complications, and was also found in the circulating blood. The patient recovered. In order to test the identity of the coccus cultivated from the circulating blood, it was inoculated into the urethra of a young man. The first symptoms of urethral inflammation appeared the day after the inoculation, and on the second day a typical gonorrhoea was present. From the pus of this experimental gonorrhoea the same coccus was again isolated in pure culture. The experimental disease lasted many months and was typical in its course, so that the identification of the coccus cultivated from the blood may be said to have been as complete as possible.

Microbic Theory of Spontaneous Combustion.—Recent investigations conducted by bacteriologists in France and Germany seem to prove conclusively that many of the fires that have been attributed to so-called spontaneous combustion are really due to the work of bacteria. Experiments made with hay, grain, cotton, etc., showed that when the least moisture was present the chemical changes brought about by the bacteria in the center of the mass were sufficient to raise the temperature so that the vegetable fibres were finally reduced to a charred mass. If oxygen was admitted at this time, by turning over the mass with a fork, the charcoal in the interior immediately began to glow and finally burst into a fierce flame, which consumed the grain. It has been long known that dirty, oily waste, which has been used for cleaning machinery, cotton in the bale, grain stored in large masses, and the fine dust in flour-mills are very apt to become heated to the extent of taking fire. It is also well established that the rise of temperature which takes place in some infectious diseases is due to the chemical products which are generated in the system by the action of micro-organisms, so that we are not altogether surprised to find it stated that most cases of so-called spontaneous combustion are now believed to be due to the chemic action set up by certain bacteria working in a favorable environment.

An Act Providing for the Testing of the Eyesight of Pupils in the Public Schools:—Be it enacted by the Senate and House of Representatives in General Assembly Convened: Section 1—The State Board of Education shall prepare or cause to be prepared suitable test cards and blanks to be used in testing the eyesight of the pupils in public schools, and shall furnish the same, together with all necessary instructions for their use, free of expense, to every school in the State. Section 2—The superintendent, principal or

teacher in every school, some time during the fall term in each year, shall test the eyesight of all pupils under his charge according to the instructions furnished as above provided, and shall notify in writing the parent or guardian of every pupil who shall be found to have any defect of vision or disease of the eyes, with a brief statement of such defect or disease, and shall make written report of all such cases to the State Board of Education.

The 107th Annual Meeting of the Hartford County Medical Association will be held at the Hunt Memorial Building, Hartford, on Wednesday, April 19, at 10.30 a. m.

ALUMNI AND SCHOOL NOTES.

Professor J. Campbell has resigned his position as attending physician to the Hartford Hospital, and has been appointed assistant surgeon.

On March 15, Dr. E. T. Smith completed his term of service in the New Haven Hospital, and Dr. P. D. Littlejohn was advanced to the position of house surgeon, Dr. F. P. Heery to house physician, Dr. L. B. Porter to assistant house surgeon, and Dr. F. W. Hulseberg entered upon his duties as assistant house physician.

'97—Dr. T. D. Pallman has opened an office on Winthrop avenue.

'97—Dr. F. Todd has recently passed the State examinations of New York.

'97—Dr. H. H. Briggs is doing work, three days a week, in the Manhattan Eye and Ear Hospital.

1900—H. C. Pitts recently substituted for two weeks as assistant house surgeon in the New Haven Hospital.

1900—H. A. Tarbell has been obliged to leave school temporarily on account of sickness.

'01—R. N. Fuller has been confined at his home in this city for some time by a severe sickness.

Practitioners registered since December 1, 1898.—Edward E. O'Donnell, M.D., Ansonia; Walter A. Reilly, M.D., Naugatuck; Mary E. Starkweather, M.D., New London; Harry J. M. Underdonk, M.D., Sherman; January, 1899, Emily F. Briggs, M.D., Voluntown. Examined by Connecticut Medical Society.

BOOK REVIEWS.

Twentieth Century Practice, Vol. XIII, Infectious Diseases.—The subject matter is divided into sections and subdivisions as follows: Ptomaines, Toxins and Leucomaines, by Victor C. Vaughan, M.D., Ph.D., of Ann Arbor; Infection and Immunity, by Harold C. Ernst, M.D., of Boston; Water-born Diseases, by Ernest Hart, M.R.S.C., of London, and Solomon C. Smith, M.D., M.R.C.P., M.R.C.S., of London; Incubation and Infectiousness, by Dawson Williams, M.D., F.R.C.P., London; Smallpox, by John William Moore, M.D., M.Ch., F.R.C.P.I., Dublin; Vaccinia, by P. Browardel, M.D., Paris; and Mumps, by Jules Comby, M.D., Paris.

Some realization of how vast the field this subject has come to occupy in the realm of medicine, cannot fail to impress the reader of such a work. And not the less that each contributor feels he can scarce do justice to his subject in the space allotted him. Vaughan, after devoting a few pages to the history of bacteriological investigation, developing proof that the infectious diseases arise from the presence of specific microorganisms, their multiplication, and the chemical products they elaborate, takes up the subject of ptomaines. He defines a ptomain as an organic chemical compound, basic in character, and formed by the action of bacteria on nitrogenous matter, which may or may not be poisonous in action. But, he says, the ptomaines do not account for the virulence of the cultures of many pathogenic germs after removal of the living bacteria. They are not present in sufficient quantity, nor possessed of sufficient toxicity to account for these effects. Indeed they may be absent altogether from the cultures of some of the most highly poisonous germs. Investigation shows that these effects are produced by a class of bodies, at first thought to be albuminous, but really non-protein, called toxins. Leaving the discussion of toxins till met with later under the various diseases, he next takes up that most interesting subject, food poisoning, — Bromatoxismus βρώμα, food, and τοξικόν, poison), being the word he coins to head this classification. This, until recently, uninvestigated subject, Dr. Vaughan handles in a most thorough and altogether interesting manner, and it will well repay the busiest man for time spent in its perusal. The author concludes with a short article on leucomaines. He defines leucomaines as basic substances, originating in the metabolic processes taking place in the animal body. They closely resemble the vegetable alkaloids, indeed many are found in plants as well as in animals. In both plants and animals they have their origin in similar bodies as nuclein or lecithin. The next section is on Infection and Immunity, by Dr. Ernst. I. Experiments leading up to our present ideas upon infection and the methods by which it occurs. II. The consideration of immunity; (a) natural, (b) acquired. Why one disease should be the more contagious, and the much mooted point of "infectious or contagious" is summed up as follows: "Every infectious disease has its infectious element, but whether or not it is likely to be propagated as a contagious one depends upon various circumstances, among which the mode of elimination of the virus from the

body is of the utmost importance." For example, the highly contagious character of scarlet fever, measles and smallpox, in which the infectious element is thrown off from the skin, versus the far less contagious character of typhoid fever and cholera, where the infectious element is thrown off in the faecal discharge. Moreover, in malaria, where the infectious element is not cast off, there can be no contagiousness. Dr. Ernst believes water, especially drinking water, has borne perhaps too much of the brunt of attack in the past, though he holds as untenable the theory held by some German hygienists, who deny that typhoid fever and cholera may be transmitted in this manner. His conclusion is that water, to cause more than a momentary influence, must be subject to continual pollution, connected with some focus where the disease-producing organisms are present in large numbers and are multiplying. He quotes Meade Bolton: "Most pathogenic microorganisms do not multiply in water sufficiently pure for drinking purposes, and unless they contain spores most of them are destroyed in a very short time, varying from a few hours to a few days." Likewise too great a role has been assigned to air as a carrier of infection. Of this fact he gives the proofs. Also, he thinks we are at present probably making a great practical error in assigning too great importance to predisposition in the causation of disease, as in hereditary predisposition to tuberculosis, where too little is made of the continual danger of infection from the natural contact of parent and child. Race certainly has much to do with this predisposition or susceptibility. Buchner insists that a marked difference exists between "ectogenous" infection (in which the bacteria can flourish outside the body,—the locality of the disease,—and then pass into the body), and "endogenous" (where the bacteria flourishes only in the body and pass from the diseased to the well). Dr. Ernst thinks that facts bear out this theory and that these racial characteristics are the result of generation of acclimatization. Dosage of bacteria, inflammation, influence of season, influence of fatigue, influence of change in body temperature, foetal infection, puerperal infection, infection of new-born infants, infection through the lungs, infection through the intestinal tract, are all in turn discussed. Then we come to the subject of predisposition to infectious diseases in general, summed up by the author as follows: "The facts seem to justify the conclusion that among bacterial products there are some that diminish the resistance of the animal to infectious diseases; sometimes it is a bacterium entirely harmless under ordinary conditions, which elaborates some soluble material that places the animal in a susceptible condition, unable to struggle against the infectious agents, sometimes it is the bacterium itself that secretes substances which favor its own development." Immunity—defined as "the condition in which the body of an animal resists the entrance of disease-producing germs, or having been compelled to allow them to enter, resists their growth and pathogenesis." The exact converse of this condition is known as susceptibility. "Natural immunity is the natural and constant resistance which certain healthy animals exhibit toward certain diseases which affect other kinds." This condition varies in different species, and somewhat in different members of the same species, and even under different conditions in the same individual. "Acquired immunity is that immunity or resistance which is due to accidental circumstances, as after suffering from an attack of rebecca, scarlet fever or vaccinia, one is

not subject to another attack. Having acquired an immunity as it were." This acquired immunity may likewise be produced in many ways, vaccination, inoculation, etc., etc. Pasteur, in 1880, formulated the so-called "exhaustion theory;" as the bacterium grows it throws out some substance essential to its life, and when this becomes exhausted, of course it must die. Then there is the "retention theory," that the growth of the bacteria in the body produces some substance which is prejudicial to their future development. Also, we have the "phagocytosis theory," and so on till we come to the "defensive proteid theory," in which there is undoubtedly much truth. This theory rests upon the fact that animals have in the serum and other fluids substances capable of rendering inert the virulent power of some of the bacteria.

Water-born Diseases—(a) In which contamination is non-living.

(b) In which contamination is living. Under the non-living contaminations of water are lead, zinc, arsenic, copper, iron, clay and marl, and various organic products of decomposing animal or vegetable substances. Under the living are entozoa and bacteria. Their summing up is as follows:

1. "Entirely irrespective of any infection by disease germs, water containing decomposing material, or flowing over land containing organic matter in a state of change, may produce disease, commonly in the form of diarrhoea."

2. "Such water, may produce disease secondarily, by the products of decomposition, though harmless in themselves, rendering other substances soluble, as in the case of peaty water dissolving lead."

3. "Water may be necessary for the accomplishment of certain acts or phases in the life history of certain parasites, e. g., the sporing stage of certain entozoa. Or water may be the means of conveying the parasites to man."

4. "Water may be necessary for the saprophytic stage of growth undergone by certain pathogenic microorganisms outside the human body, as in cholera, typhoid and many forms of dysentery and diarrhoea, and for the alternate phases of such pathogenic organisms as the malarial parasite, which is probably but a type of many forms yet undiscovered."

5. "Water may not be the medium in which pathogenic organisms grow, but may be the vehicle by which they are distributed."

Incubation and Infectiousness, by Dawson Williams. The period of incubation is defined as: "The time which elapses between the establishment of a contagious virus in the body, and the onset of characteristic symptoms."

Dr. Williams says that theoretically it might be supposed that the onset would be gradual, but even on theoretical grounds we can account the rapid, almost explosive onset of some diseases. He says we have (n) bacteria entering the body, each capable of dividing thrice in 24 hours. At the end of three days we should have $n \times 500$ present, while in the next 24 hours the number would increase to $n \times 4,000$. Presence of $500 \times n$ bacteria might not be expected to cause anything like a proportional effect to $4,000 \times n$ bacteria, and

consequently the symptoms would show remarkably increased severity. With so many things to influence the period of incubation, such as, varying exposure, normal resistance, phagocytosis, dosage of bacteria, etc., it is remarkable that the period of incubation should be so constant.

Dr. Williams then gives a list of the various acute specific infectious diseases, their periods of incubation, duration, and time during which there is danger of transmission.

Dr. Moore's article on smallpox is scientific and complete. Especially under the heads of diagnosis and treatment, one derives many points for possible future use.

The two remaining articles by Dr. Browardel and Dr. Comby present few new facts for consideration, being, perhaps, a trifle more complete and more up-to-date than articles on the same subjects in other modern works on medicine.

As in all books of this character, where the subject matter is divided up among several contributors, there is a lack of continuous arrangement, and some articles repeat more or less the ground covered by others. However, Volume XIII of the Twelfth Century series is a book every physician should welcome to his library, and being there, would be the gainer by not allowing the dust to accumulate too thickly thereon.

S. M. H.

BOOK NOTICES.

Mechano-Therapy. A text book of massage and medical gymnastics, by Axel V. Grafstrom, B.Sc., M.D. The subject of mechano-therapy is presented in a condensed form for medical student and nurse. The system as practiced in the Royal Gymnastic Central Institute, Stockholm, Sweden, has been followed. Price, \$1.00 net. Published by W. B. Saunders, Philadelphia, Pa.

A Text Book on Practical Obstetrics. By Egbert H. Grandin, M.D., gynaecologist to the Columbus Hospital, etc., with the collaboration of George W. Jarman, M.D., gynaecologist to the Cancer Hospital, etc. Second edition. Revised and enlarged; fully illustrated. Published by The F. A. Davis Company, Philadelphia, New York, Chicago.

Nervous and Mental Diseases. By Archibald Church, M.D., Professor of Clinical Neurology and of Mental Diseases and Medical Jurisprudence in the Northwestern University Medical School, the Chicago Medical College, etc., and Frederick Peterson, M.D., Clinical Professor of Mental Diseases in the Woman's Medical College, New York, etc. This book has been written for medical students and general practitioners. It makes no claim to be other than a carefully prepared text-book by two authors of wide experience in teaching and practice. Price, \$5.00, cloth; \$6.00 morocco, net. Published by W. B. Saunders, Philadelphia, Pa.

Diseases of the Ear, Nose and Throat. By Seth Scott Bishop, M.D., D.O.L., LL.D., Professor of Diseases of the Nose, Throat, and Ear in the Illinois Medical College; Professor in the Chicago Post-Graduate Medical School and Hospital; Surgeon to the Post-Graduate Hospital, one of the Editors of the *Laryngoscope*, etc. Second edition. Thoroughly revised and enlarged. Illustrated with ninety-four chromo-lithographs and two hundred and fifteen half-tone and photo-engravings. 6½ x 9½ inches. Pages xix-554. Extra cloth, \$4.00 net; sheep or Half-Russia, \$5.00 net. The F. A. Davis Co., Publishers, 1914-16 Cherry street, Philadelphia.

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CELL DIVISION IN CARCINOMA.

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Shortly after the enunciation of the cell theory by Schleiden and Schwann in 1838-39, Remak, Kölliker and others showed that an essential part of the process of cell reproduction was the division of both nucleus and cell body. It was not until 1873, however, that the researches begun by Schneider and continued by Fol, Flemming, Hertwig and others, began to unravel the intricate processes of cell division. At the present time the main facts of the process are quite well known and many details and variations have been described. Two main methods of division are recognized, mitosis and amitosis. The first is almost universal, occurring in both plants and animals; the latter is at most very infrequent and certainly of little if any importance in the production of tissues.

Earnest attention has been directed to the study of carcinoma cells to discover something characteristic, and although a certain amount of anaplasia¹⁸ is recognized, yet nothing specific has been found. Even the processes of cell division in carcinoma have been scrutinized, but according to most observers there is nothing here that is distinctive. Among the earliest investigators of cell division in carcinoma were J. Arnold² and Martin.²⁵ More recently Stroebe, Lustig and Galeotti and Hansmann have added valuable contributions to the subject. The general conclusion among most observers has been, that the main processes of cell division in tumors is essentially the same as in the ovum and plant and animal tissues, in regeneration and repair. Although mitosis in carcinoma may perhaps

have nothing characteristic about it, there are many interesting details and variations in the process and certain peculiarities which are found mostly, if not altogether, in this condition and have a diagnostic value.

In the resting cancer cell the nucleus has a distinct membrane which reacts to stains much like chromatin and often small granules may be observed on its inner surface, where the nuclear fibrils meet the membrane. The nucleolus is spheroidal with smooth outline, reacts to chromatin stains, and when very large, shows a less deeply stained central area, in which occasionally fibrils are seen. Often several nucleoli may be present, but usually there are not more than two or three, and one is decidedly larger than the others. From the nucleoli, fibrils radiate toward the nuclear membrane, some reaching it and others joining with neighboring fibrils, forming a network. Along this network are found chromatin granules varying in size, but usually quite small. There seems to be a difference of degree rather than of kind in the nucleoli, granules and membrane, and there is evidence that all these pass into the spireme in cell division. The nucleoli, threads and granules lie embedded in the nuclear matrix, which is clear and homogeneous and is always clearly differentiated from the cytoplasm even when the nuclear membrane has disappeared.

The centrosome is situated, I believe, in the nucleus and not in the cytoplasm, as is true of many cells. It is a very minute body, usually spheroidal, and is said by Hansmann¹⁷ to react to acid stains and especially to eosin when stained for several hours in a weak watery solution. It may also be stained by Flemming's triple stain or the Ehrlich-Biondi fluid; but by far the most satisfactory reagent is Heidenhain's iron-haematoxylin, which stains it black. Lustig and Galeotti²⁴ have described the centrosome in the resting state of the cell as located in the cytoplasm near the nucleus, of a rounded or oval form, and surrounded by a clear centrosphere with cytoplasmic radiations. I have not been able, even with iron-haematoxylin, to demonstrate the centrosome in the resting cell, and this is one reason for believing that the centrosome is intranuclear where it might easily be confused with small nucleoli or concealed by chromatin granules. The first appearance of the centrosome is in the spireme stage *after* the disappearance of the nuclear membrane, when it is found close to the chromatin; this is further evidence of its intranuclear origin. While perhaps the majority of cytologists consider the centrosome in cells in general as extranuclear, there is no lack of authority (Hertwig and Hanse-mann) for its intranuclear position. Also, the appearance of the

centrosome coincident with the disappearance of the nucleoli makes it possible that it may have been confused with one of them, and still further indicates its intranuclear position.

While the nuclei are usually spheroidal or ovoidal, they are frequently irregular in outline, and especially near areas of degeneration or leucocytic infiltration, they are often very large and markedly polymorphic, some of the lobules being joined to the main mass by only narrow strands of karyoplasm. In these same areas many of the cells are polynuclear.

A very noticeable feature of cancer cells is the variability in the number of the chromosomes in different nuclei. Klebs¹⁹ first called attention to this and applied the term hyperchromatosis to the condition where there is an increase in the number of chromosomes and the term hypochromatosis to the opposite condition. It is impossible to accurately count the chromosomes except in hypochromatic cells, where the number may be as small as six. In hyperchromatic cells the number of chromosomes may reach fifty or more. Hauser gives the number in the cells of a cancer of the stomach as between eight and twelve. The normal number in man is usually stated as sixteen, but Flemming⁵ recently has placed the number as high as twenty-four or more. It is nearly impossible to tell to which class a cell belongs except in those stages of mitosis when the chromosomes are evident; but cells with large nuclei and many nucleoli are usually hyperchromatic. There does not seem to be any necessary relation between the number of the chromosomes and the size of the cell itself; a small cell may be hyperchromatic and a large cell hypochromatic. As the number of chromosomes for any given species of animal is a constant one, a variation from this normal becomes very significant, and especially a decrease in the number.

Having considered the nucleus at rest we will turn to the nucleus in division. First, mitosis and its varieties will be described, then amitosis and degenerate forms. The following classification of the varieties of cell division found in carcinoma will serve as a basis for the discussion.

MITOSIS:—1. Bipolar.

2. Multipolar.—*a.* Primary forms with early rapid successional division of the centrosome.

b. Secondary forms with late division of the centrosome.

3. Hyperchromatic.

4. Hypochromatic.

5. Asymmetrical.

6. Degenerate.

AMITOSIS:

Mitosis will be divided as usual into four stages, (1) prophase, (2) metaphase, (3) anaphase, and (4) telophase.

PROPHASE:

The first evidence of the beginning of division is seen in the increase in the size of the nucleoli, their margins becoming irregular, and in the size and number of the chromatin granules, so that they may nearly fill the nuclear space. Next the nucleoli disappear, having broken into granules, and by the merging of these granules a skein is formed which thickens and shows open spaces between its loops (Photo. 2). With the formation of the spireme and the disappearance of the nucleoli and the nuclear membrane, the chromatin skein lies naked in the cytoplasm, surrounded by a clear zone. Although Lustig and Galeotti²⁴ assert that the nuclear membrane never entirely disappears, such has not been my experience, and such would be an exception to cells in general. The spireme breaks into segments, the chromosomes, which are quite variable in shape and size. They may be V shaped or S shaped, rod-like or spheroidal, thick or thin. Hansemann¹¹ says that short, thick chromosomes are always pathological and most frequently found in carcinoma. Spheroidal chromosomes may be indicative of lost vitality in the cell, for they are most likely to be found in those cells showing degenerative changes. It is at the spireme stage (Photo. 3) that I have first seen the centrosomes and achromatic spindles, lying near the chromatin, the spindle fibres diverging from the centrosome to the chromosomes. I have been unable to discover the amphiaser as described by Lustig and Galeotti.²⁴ Sometimes the aster is visible at this stage, but often not, and no explanation of this variability has been given.

The function of the achromatic half spindle is to push the chromosomes together near the equator of the cell to form the equatorial plate. The data for this assumption are the following: Starting with a spheroidal mass of chromosomes where the half spindle rests against them, there is a marked plate formed by the heaping up of the chromosomes, while the rest of the mass still has an even border (Photo. 21). There are as many plates as there are half spindles and the plates and half spindles are always similarly related. Secondly, the fibrils of the half spindle frequently bend outward, and this could be produced only by a force pushing against a resistance, in this case the chromosomes.

The centrosome having divided, the daughter centrosomes pass in opposite directions around the chromatin until they are diamet-

rically opposite, each with its achromatic spindle. The complete nuclear figure (Photo. 7) now consists of the following parts: A mass of chromosomes in the center, forming the equatorial plate, which resembles a rosette when viewed parallel to the spindle axis, with rather ragged margins, due to the projecting chromosomes. The central opening of the rosette is quite variable in size, sometimes hardly noticeable, in other cases, and especially in large cells, widely open. From the equatorial plate on each side converging to the centrosome are the half spindles composed of fibrils, about twelve in number—which stain a bluish gray with iron-haematoxylin or reddish with eosin, saffranin and Ehrlich-Biondi fluid. The origin of the half spindle in cells in general has been a subject much discussed by cytologists, many believing that it is derived from the cytoplasmic radiations of the aster, others considering that it is formed from the lining of the nucleus. It is my belief that the half spindle in carcinoma cells is intranuclear in origin and not astral radiations. Some evidence in support of this is found in the fact that while the half spindle is nearly always distinct, in properly prepared sections, the astral rays are often indistinct or entirely absent. Secondly, the early position of the spindle fibrils close to the chromosomes would indicate its nuclear origin.

The centrosome (Photos. 6 and 10) is much more difficult than the spindle to demonstrate; but in iron-haematoxylin sections it can usually be found. It is a very tiny body situated in the focus of the half spindle, with the spindle fibrils usually reaching to it and not surrounded by a clear portion of the centrosphere, as has been described by Lustig and Galeotti.²⁴ Sometimes astral radiations, about six fibrils in number,¹⁸ can be seen starting from the centrosome and diverging principally away from the half spindle. Some fibrils can be traced nearly or quite to the cell periphery.

There are some minor points of variation in the nuclear figure from that just described. Sometimes the half spindle is short and broad, then, again, it is long and narrow. The whole figure usually lies near the center of the cell, but it may be quite eccentrically placed, so that the apex of the half spindle (Photo. 17) is close to the periphery of the cell; this, however, is quite unusual. Occasionally some of the chromosomes are not pushed into the equatorial plate, but remain upon or near the fibrils of the half spindle or are entirely outside of the mitotic figure, free in the cytoplasm, the so-called "strayed chromosomes" (Photo. 9). It is possible that those chromosomes which are among the achromatic fibrils are eventually brought into the mitotic figure, but those outside the spindle free in the cytoplasm go to destruction. However, it is believed by Hanse-

mann¹⁸ that these chromosomes, too, get into the figure and that this variation occurs in normal cells. A different interpretation might in some cases be given to this mal-arrangement of the chromosomes, viz.: that it is an early movement of some of them before the main mass starts.²⁰ A great constancy is noticed in the presence of the half spindle, but there is considerable variation in the thickness and length of its fibrils and a greater variation in the size and shape of the spindles, than occurs in normal cells.

METAPHASE.

This is a very important stage of the division process, because it is here that the essential step is taken, viz.: the longitudinal splitting of the chromosomes into precisely equal halves. I have not been able to observe this in cancer cells, but because it is so universal in plant and animal cells and is the fundamental phenomenon of mitosis, there is no doubt of its occurrence here.

ANAPHASE (Photos. 8 and 9).

In this part of the division process the divided chromosomes are distributed, usually equally to the two daughter nuclei, the daughter masses moving toward the centrosomes. As they move apart the interzonal fibres are seen connecting them; but these do not seem like those of the half spindle, they are thicker and often have granules scattered along them and what looks like small pieces of chromatin may cling to them. Occasionally there is seen in the equatorial region of the cell a small body, which is produced perhaps by the thickening of some of the interzonal fibres, is probably the homologue of the "cell-plate" of plant cells and is known as the "mid-body." This is not peculiar to cancer cells, but is frequently observed in the cells of normal tissues. Sometimes a string of chromatin is seen among the interzonal fibres, connecting the masses. This is considered pathological by Schottländer, but Hanseemann has seen the same phenomenon in normal cells.

In the late anaphase, when the cell cleavage is progressing, a delicate spindle may be seen between the daughter masses, consisting of two halves with their apices together at the plane of cleavage; this is known as the central spindle and is thought to be the primary spindle of the amphiaster. Earlier in the anaphase this is concealed by the connecting fibres. Possibly the central spindle is produced by the cleavage force carrying the interzonal fibres together and finally severing them; but if this be true the interzonal fibres have quite changed in character. The later history of the central spindle is unknown.

There seems to be two methods of division of the cytoplasm, one where a sort of a membrane forms in the equator, as is usual in plant cells, and is sometimes seen in animal cells, and during the process of regeneration. The other and usual one in cancer cells, is to have the separation accomplished by a constriction or cleavage at the equator of the mother cell. This cleavage in cancer cells may be delayed until the daughter nuclei have assumed membranes. This delay may also occur in normal cells, as has been shown by Flemming in pigment cells of larval salamanders.

The mechanism by which the daughter chromatic masses are separated in plant and animal cells is a much mooted question among cytologists. Van Beneden, Boveri and Flemming believe that the divergence of the chromosomes is due to the contraction of the antipodal fibres. Drüner, from observations on the cells of the salamander, believes that the central spindle pushes the chromatin apart, and there is some evidence that this may be the case in cancer cells, as the interzonal fibres are occasionally bent as though pushing against resistance. Hermann believes that the half spindle pulls the chromosomes apart, and there is evidence that this may be so in cancer cells, in that, while in the prophase the fibrils may be bent, in the anaphase they are straight and taut, as though they were pulling against resistance. Others have suggested that the movements of the chromosomes are chemotactic in character. There is reason to believe that in cancer cells the antipodal fibres cannot accomplish the separation of the chromosomes, because the centrosome is often so near the cell periphery that it would be impossible for them to contract sufficiently to cause the separation, and, further, these fibres are often invisible or too insignificant for so great a function.

TELOPHASE.

The closely packed, flattened mass of chromosomes pass through retrograde changes, finally forming a network which becomes surrounded by a membrane, the nucleoli appear and the cells are again in the resting state. These changes I have not been able to follow very satisfactorily.

According to Stöhr, cell division in man occupies about one-half hour, and it is probable that there is little modification of this in dividing cancer cells, although in very rapid growth it may be somewhat accelerated. The stage that is very variable is the resting condition, the length of the time of inactivity being determined by nutritive conditions, and the growth and divisional stimuli. Some idea of the comparative length of the different stages can be ob-

tained by observing their relative frequency. By far the greatest number of nuclei are in the resting state, which marks this as the condition for the longest time. In any tissue the proportion of cells in the various phases of mitosis to the resting cells is a measure of the activity of cell division. In cancers the most frequent mitotic stage is the early prophase; second, the spireme; third, the equatorial plate, and fourth, the metakinetic figure. This indicates that the changes leading to the formation of the spireme take the longest time and that the cell is next longest in the spireme stage, and so on. Out of one hundred cells, on the average, ninety would be at rest; some seven in the prophase and the rest in the anaphase and telophase. Mitoses are usually found in groups, and often several in about the same phase will be seen close together. The explanation of this grouping would seem to be found in the similarity of relation to the food supply and the divisional stimulus. What constitutes the divisional stimulus and the factors entering into its control are little known. It is believed, however, that it is mainly a chemical matter. Adult cells can be stimulated to divide by chemical agents, as in the hyperplasia resulting from the injection of foreign substances into the blood; by mechanical means, as pressure; by injury, and in regeneration of lost parts. In most cases the immediate cause of cell division consists probably in local chemical changes (Wilson).

Multipolar mitoses are quite numerous in carcinoma and are found most frequently near degenerating areas or regions of leucocytic infiltration. They serve for the reduction of the chromosomes in hyperchromatic cells to the normal number and seem to result from the growth stimulus exceeding in strength the divisional. Cell division rarely follows nuclear division in those mitoses having more than three poles.

Attention was first called to multipolar mitoses by Eberth⁸ in 1876, who observed a cell of Descemet's membrane of the frog dividing into four parts. These were first described in cancer by Martin.²⁸ Hansemann has not found them in normal human or animal tissues and considers them pathological. They have been seen in regenerations by Stroebe and Nauwerck; in artificially produced inflammation of the epidermis of frogs (Schottländer²¹); in the lungs of salamanders (Flemming); in plant cells (Hegelmaier), and in embryonic livers of mammals (Kostanecki²²), where mitotic figures with eight or ten daughter masses have been seen. Multipolar mitoses have been produced artificially by Hertwig, who subjected echinoderm eggs, $1\frac{1}{2}$ hours after fertilization, to the action of a .025 per cent. solution of quinine, or 5 per cent. chloral, for

twenty minutes, and killing them two hours after their removal from the solution. By treating the regenerating epidermal cells of the salamander after a wound, with 5 per cent. solution of potassium iodide for several days, Galeotti⁷ produced both multipolar and asymmetrical mitoses. Similar results were obtained with .1 per cent. antipyrine and cocaine solutions, and with other chemical agents also. Waldstein²⁸ has reported a very interesting case of pernicious anaemia in which multipolar mitoses were found in the cells of various organs, but especially in the marrow cells.

The tripolar variety (Photo. 10) is by far the most frequent, and in some places one out of ten or fifteen mitoses may be of this variety; but is usually much less frequent than this in those cancers where it is found, and is generally altogether absent. The phases of this form, as is true of multipolar mitoses as a class, are similar to those of the bipolar, but the figures are quite different. In the prophase the centrosome divides into two, and one of these further divides, so that there are three centrosomes which become arranged around the chromatic mass at equal intervals. The half spindles and astral rays are similar in structure to those described for the bipolar mitosis. In the stage corresponding to the equatorial plate of the bipolar, the chromatin is arranged in three plates radiating from a central line of junction and appearing, when viewed at right angles to the plane of the spindles, as a triradiate mass with arms of about equal length and size, occasionally broken, and separated by angles of about 120 degrees each. Occasionally one angle is considerably smaller than the others, or one angle may be much larger than the rest, making a somewhat T shaped chromatic mass. A great variety of appearances (Photo. 11) are presented by this mitosis, depending upon the plane of section and the direction of view. In the anaphase the triradiate chromatic mass splits into three V shaped daughter masses connected by interzonal fibres and each is drawn to its centrosome. The telophase proceeds as in bipolar mitosis, the cell frequently dividing by cleavage into three parts; often, however, cell division does not occur and a trinuclear cell is the result.

The quadripolar mitosis of the primary form results (Photos. 12, 13 and 22) from an early second division of each centrosome, and shows at the equatorial stage a chromatic mass of an X shape, when seen at right angles to the plane of the spindles, and each angle between the arms is about 90 degrees; but very frequently two angles are smaller and two greater than 90 degrees. The nuclear figure presents four centrosomes with astral rays, four half spindles, and the chromatin divides into four angular masses connected by

the interzonal fibres. Cell division rarely, if ever, occurs in this mitosis, the result being a quadrinuclear cell.

Nuclear figures with five and six and even more half spindles and centrosomes may be found, but they are infrequent. All of these figures are quite complex, and many peculiar appearances, difficult of interpretation, result from the cells being cut in various ways. To avoid errors, one should select only those mitoses which show tissue above and below them, and on this account rather thick sections (20 microns) should be used. In these mitoses nuclear division probably is never followed by cell division, multinuclear cells resulting.

The secondary forms of multipolar mitosis are very much less frequent than the primary forms, and are of two types. The first, where one centrosome divides in the late prophase, the other one remaining undivided. Here the chromosomes are arranged in an equatorial plate in a single plane, as in the bipolar mitosis, and on one side of this plate there are two centrosomes and two half spindles, while on the other side there is only one centrosome and half spindle.

In another type of the secondary form, both centrosomes divide in the late prophase and there are two centrosomes and two half spindles arranged on opposite sides of the chromatin plate, which is equatorially situated in a single plane. It is probable that these mitoses distribute the chromatin equally to the daughter nuclei.

Asymmetrical mitosis, as defined by Hansemann,⁹ exists when there is an inequality in the number of chromosomes in the daughter nuclei. This form of mitosis is rather infrequent in carcinoma, and is correlated with an inequality in size of the centrosomes. They were first described in cancer by Klebs.¹⁰ The bipolar mitosis most frequently exhibits asymmetry, but it is occasionally seen in the tripolar form also. According to Stroebe¹¹ asymmetrical mitoses are found in sarcoma, regenerative growths, and after irritative stimulus, as well as in carcinoma. Hansemann¹² says very emphatically that nowhere but in carcinoma are asymmetrical mitoses found, and lays considerable stress upon their diagnostic value. In an asymmetrical division there is a distinct failure of the purpose of mitosis, which is the equal distribution of the chromosomes to the daughter nuclei, and it is therefore an important deviation from the normal. Asymmetrical mitoses have been produced experimentally (Galeotti⁷) by the application of a .05 per cent. solution of antipyrin to a healing wound in the epidermis of a salamander.

It has been noted above that a variation in the number of chromosomes is a marked characteristic of cancer cells. Pfitzner²⁸ and others have noticed this and sought to prove thereby the embryonal character of these cells. Several explanations have been suggested to account for this variability. Stroebe²⁴ says that it may be the result of disturbed nutrition. Klebs¹⁹ considers that a destruction of some of the chromosomes may occur during division, giving rise to hypochromatosis; or that in some cases the nucleus of an included leucocyte fuses with that of the cancer cell, resulting in hyperchromatosis. There are many obvious reasons for doubting the accuracy of the latter statement. The condition of "strayed chromosomes," first described by Retzius,²⁹ may be another causative factor. The explanation which perhaps is the best is that advocated by Hansemann,¹¹ viz.: that hypochromatosis is due to asymmetrical mitosis.

Hyperchromatic mitoses (Photo. 22) are frequently found in various pathological growths, but most often in cancers. They may divide by the multipolar or bipolar mitosis. In the multipolar division a reduction in chromosomes would occur, resulting in nuclei of the normal number; in the second case, hyperchromatic cells would be produced.

Multinuclear cells may show mitosis in all the nuclei at the same time, where the nuclear figure of each is distinct and separate from the others, or some of the nuclei may be in mitosis, while others are inactive, or some may divide by mitosis and others by amitosis. Cell division does not follow the nuclear division in these cases. Mitoses in multinuclear giant cells of sarcoma have been studied by Klebs;¹⁹ in giant cells of tuberculosis by Baumgarten, and in tumors by Stroebe²² and Krompecher.²⁰ It is improbable that a multipolar mitosis is produced by the synchronous mitosis of the nuclei of a multinuclear cell, but rather each nuclear figure remains separate.

Polymorphic nuclei are frequently found in carcinoma cells, but for the most part near degenerating areas or those infiltrated with leucocytes. It is altogether probable that some of these polymorphic nuclei form hyperchromatic and multipolar mitoses, but many of them divide by amitosis. In neither case does cell division follow the division of the nucleus. Polymorphism in nuclei seems to result from the active or passive movements of the nucleus, and certainly in carcinoma is indicative of lost vitality on the part of the cell and foretells impending dissolution.

It is probable that degeneration may overtake the cell in any stage of mitosis. Some mitoses may be found, especially near de-

generating areas, which show the chromatin in small spheroidal or elongated masses, amorphous and more plastic than usual, and where undoubtedly the individuality of the chromosomes is more or less lost (Photo. 19). It seems as though the degenerative changes had overtaken this nucleus in the prophase. Some of these degenerate forms seem to go on to cell division, but the majority do not. Hansemann says that he has seen degenerated chromosomes only in carcinoma and sarcoma.

Near areas infiltrated with leucocytes, cancer cells with included leucocytes, may be seen, which has been interpreted as indicating phagocytosis on the part of the cancer cell (Stroebe). Ziegler thinks that cancer cells use the leucocytes for food. But it is more probable, it seems to me, that the leucocyte is rather acting as a parasite in these cases, tending to destroy the invaders, for in these areas numerous disintegrating cancer cells with included cells may be found.

AMITOSIS.

The chief characteristic of amitosis is that the division of the nucleus occurs without any increase in the chromatin and without the aid of the centrosomes or the formation of the achromatic figure. Most cytologists have concluded that amitosis is of a secondary character and indicates that the series of divisions is coming to an end. Vom Rath²⁸ is more radical, and concludes that amitosis is the "death warrant" of the cell. Such seems to be the fact in carcinoma, and I have never seen this form of nuclear division followed by cell division. Amitosis in carcinoma plays no role in cell reproduction and is principally found in polymorphic cells near degenerating areas.

The main points of this discussion may be summed up as follows:

1. In carcinoma cells the centrosome and half spindles are intranuclear in origin.
2. Multipolar mitoses indicate a loss of divisional vigor, and a more rapid hyperplasia is produced by the bipolar mitosis, where growth and division are in their proper relation of strength, than by multipolar mitosis. Therefore the presence of numerous bipolar, rather than multipolar mitoses, is indicative of malignancy.
3. The production of multipolar and asymmetrical mitoses, similar to those of carcinoma, by chemical agents, suggests that a deranged chemistry may be a factor in the aetiology of cancer.
4. Hypochromatic and asymmetrical mitoses are found usually only in carcinoma; hence their presence is of considerable diagnostic value.

5. Amitosis in carcinoma does not result in hyperplasia.
6. Polymorphism in nuclei indicates impending dissolution.

Zenker's fluid was used for fixation and sections were stained by Flemming's triple stain, the Ehrlich-Biondi fluid, safranin, Heidenhain's iron-haematoxylon and haematoxylon and eosin. The most generally satisfactory stain is haematoxylon and eosin, which should be used for a long time and in a weak solution. This combination was especially valuable for photomicrography, as the achromatic and archoplasmic fibrils which are so difficult to photograph, stain red with the eosin. For the demonstration of the centrosome, iron-haematoxylon is the method *par excellence*. Carbutt's orthochromatic and Kramer's isochromatic plates were used with a rather dense bichromate color screen, and there is no question whatever of the vast superiority of these over the ordinary plate. An electric arc light furnished the illumination. The photomicrographs were made with a Zeiss 1-12 achromatic oil immersion objective, N. A. 1.30 and projection ocular No. 2.

I wish to express my indebtedness to Dr. C. W. Kellogg for the excellent sections which made this study possible, and to Dr. M. C. White for valuable advice in photomicrography.

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EXPLANATION OF PHOTOMICROGRAPHS.*

Zeiss 1-12 achromatic oil immersion objective N. A. 1.30, projection ocular, No. 2.

No. 1. Resting nucleus of carcinoma cell. Shows chromatin granules, nucleolus, nuclear network and membrane. Iron-haematoxylin.

No. 2. Spireme stage. Nuclear membrane disappeared. Haem. Eosin.

No. 3. Later prophase, showing chromatin plate and half spindle, one centrosome and aster. Iron-haem.

No. 4. Spireme stage in a large cell with included cell. A resting nucleus near. Iron-haem.

No. 5. A hypochromatic nucleus with V shaped chromosomes. Iron-haem.

No. 6. Equatorial plate with half spindle, centrosome and aster. Iron-haem.

No. 7. Equatorial plate with half spindles, centrosomes and asters not visible. Haem. Eosin.

No. 8. Anaphase. Interzonal fibres, two half spindles, one disappearing, and Zwischenkörper. Haem. Eosin.

No. 9. Early anaphase. Two half spindles, straggling chromosomes, some near half spindle and some near cell periphery. Haem. Eosin.

No. 10. Tripolar mitosis in equatorial plate stage, viewed at right angles to spindle axis. Shows three half spindles, with triradi-

*These explanations were made from the negatives and unfortunately some of the finer details have not been reproduced.

ate chromatin plate (one arm broken), two centrosomes (the third is out of focus). Iron-haem.

No. 11. Tripolar mitosis cut. A part of chromatin plate and half spindle are gone. Shows one centrosome and slight aster. Iron-haem.

No. 12. Quadripolar mitosis in anaphase. Four half spindles, some well formed and pushing chromatin into plates. Haem. Eosin.

No. 13. Quadripolar mitosis in anaphase, three spindles, showing one not formed. Two centrosomes and asters show dimly. Haem. Eosin.

No. 14. Probably bipolar mitosis, viewed obliquely and partly cut away. Iron-haem.

No. 15. Tripolar mitosis, hypochromatic, with early passage of chromosomes; three half spindles dimly seen. Haem. Eosin.

No. 16. Hexapolar mitosis in late anaphase. The daughter nuclei being in different planes, some are out of focus. Interzonal fibres (*Verbindungsfasern*). Haem. Eosin.

No. 17. Bipolar asymmetrical mitosis. Apex of half spindle near cell periphery. Haem. Eosin.

No. 18. Degenerate mitosis in late anaphase. Chromatin string joining daughter nuclei, and a bud-like process containing chromatin seen on one side. Chromatin particles scattered through cytoplasm. Haem. Eosin.

No. 19. Degenerate mitosis, probably in spireme stage. Chromatin scattered through cytoplasm. Haem. Eosin.

No. 20. Amitosis. Slender connections between parts of nucleus. No increase of chromatin, no centrosomes nor spindles. Iron-haem.

No. 21. Hyperchromatic nucleus preparing probably for bipolar mitosis. Individual chromosomes seen. One half spindle, showing its pushing effect on chromosomes. Haem. Eosin.

No. 22. Quadripolar mitosis. Three half spindles, one aster showing; other spindle not developed. Haem. Eosin.

No. 23. Degenerate mitosis in late anaphase. Chromatin string joining daughter nuclei. Separation partly by cleavage and membrane formation (?). This may be only the optical effect of the fissure which extends presumably around the circumference of the cell. Iron-haem.



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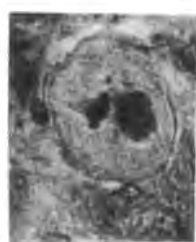
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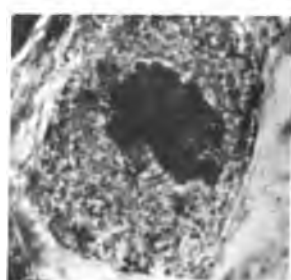
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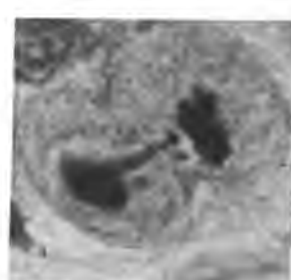
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INFECTIVE OTITIS.*

BY F. M. WILSON, M.D., BRIDGEPORT, CONN.

Bacterial invasion of the human body takes place in a great variety of ways, unfortunately many of them still unknown. But certain routes of bacterial travel are well established, and to one of these well-traveled bacterial highways I wish to call your attention to-night. It leads from the pharynx up the eustachian tube to the tympanum. From here the stream of bacterial travel, in the majority of cases, forces its way through the drum membrane and out through the external auditory canal. In a smaller number of cases it also finds its way into the other cavities of the temporal bone, and in a still smaller number reaches the cranial cavity. Exceptionally this stream of bacterial travel is in the other direction, and the tympanum becomes infected from the external auditory canal.

This process was named before bacteria were thought of as a causative agent, and the name still persists, otitis media, purulenta or suppurativa, as you please, acuta or chronica, according to circumstances, but is usually spoken of as "suppurative otitis," though of late the name "infective otitis" is creeping into use. "Infective otitis" is exceptionally associated with a very large number of diseases, but is most often caused by local infections of the nose and pharynx.

The modern influenza (which is bound to be called "grippe," no matter how many protests are entered against the name) probably furnishes more cases than any other one affection, and many aurists think that the otitis which follows "grippe" is more likely to infect the deeper structures of the head. Scarlet fever, measles, tuberculosis, and the other constitutional diseases, of course, infect the pharynx first, and from there the process extends to the tympanum. Among accidental causes the nasal douche figures to a certain extent. In fact, so many cases have come under my own observation that I rarely order it. I also have on record a considerable number of cases where blowing the nose violently has forced a bit of infective material up the eustachian tube. Indiscreet use of Politzer air-bag, also, occasionally causes suppurative otitis in the same way.

* Read before the Bridgeport Medical Association, March 7, 1899.

All observers agree that the nose and pharynx are never sterile, even when entirely free from inflammation. Some of the more frequent inhabitants are the staphylococcus pyogenes (albus and aureus), the streptococcus pyogenes, the pneumococcus, and the tubercle bacillus. There are many others, but I mention these because they are also among the more frequent travelers up the eustachian tube.

An infective process like this can hardly be said to have any natural history. At one end we have a mild infection of the pharyngeal portion of the eustachian tube, with perhaps slight earache, and the process stops there. At the other end of the line we may have a case where tube, tympanum, all the cavities of temporal bone, the whole base of the brain and the cavities in the brain are filled with swarms of destructive bacteria, as shown by the autopsy; and between these two there is every possible range of severity. Fortunately there are more mild cases than severe ones. Fortunately many earaches never come to rupture or incision of the drum membrane. Fortunately cases which do rupture or require incision generally do well if carefully attended to at the time. Unfortunately some cases are neglected and the infection becomes chronic. These cases always lose some hearing power, and sometimes all of it. From the ranks of the chronic cases come most of the cases of sinus thrombosis, meningitis and abscess of the brain. Exceptionally an acute infection goes on to these same results in spite of the most assiduous care from the start.

Next, what can be done to prevent it? Just here let me allude to a curious medical custom. The throat and ear, until quite recently, were two distinct specialties, and it was comparatively rare for a man to cover both fields. A more irrational subdivision could hardly exist, and, as more than three-quarters of all ear diseases come from the throat, there usually was not much for the poor otologist to do in the preventive line. The most radical advance in preventive treatment has been the recognition of the frequency and importance of adenoid growths in the pharynx. But nasal obstruction, large tonsils and adenoid growths are so mixed and mingled with each other in causing "infective otitis," as well as other forms of ear disease, that it is often difficult to separate them. Of course any general measure which improves the health and increases the natural resisting power of the mucous membrane of nose and pharynx must also lessen the liability of infection of the tube. But it is only within ten to fifteen years that nasal and pharyngeal obstructions have received anything like their legitimate share of attention. While the question may be fairly raised as to whether just

now we are not in danger of getting too much naso-pharyngeal surgery, it is absolutely certain that twenty years ago there was too little of it.

Next, what can be done after infection of the tube has taken place and the redness of the drum and the earache have begun? It is, of course, evident that an infective process, sneaking up this inside route to the tympanum, cannot be directly interfered with, we cannot get at it, so that the old time remedies of heat, leeches and anodynes still hold sway, though of late paracentesis of the drum membrane has been advocated as an abortive measure. Incision of the membrana tympani early in the case, before the tympanum is actually infected, has three advantages and one danger. It unloads the overfull blood vessels, relieves the pain and makes sure of a ready exit for the serum, which usually precedes the pus. The one danger is of starting a separate infective process from the external auditory canal into the tympanum. This rarely happens, though, reasoning theoretically, we should expect it often, because it is so difficult to even partially sterilize the field of operation. After it becomes reasonably certain that the tympanum contains fluid, there is, of course, no difference of opinion as to the propriety of paracentesis, and as the cavity is already infected, antiseptic precautions are not as necessary. Heat, leeches and anodynes all relieve pain, but I know of no theoretic reason why abstraction of blood or the administration of an opiate should have any tendency to stop an infective process creeping up the eustachian tube. There is a theoretic reason why heat should have such an influence, viz.: the well known fact that the commoner forms of pyogenic bacteria grow best at the normal temperature of the body and that any considerable variation stops their activity, and this tallies with clinical experiences, where heat easily holds first place.

As an extreme clinical illustration, I may cite the following family history:

The father has had one attack of infective otitis, which went on to mastoid involvement and operation. The mother has had one attack which did not come to perforation. The oldest child had both ears infected, was not treated, and is now totally deaf. There are six other children and none of them have escaped. Taken all together, they have in the last twelve years had eleven attacks of "infective otitis," but in only two has perforation taken place, and all have recovered normal hearing. The treatment in every case has been the early and thorough application of heat to the external auditory canal, the method being to arrange a large pitcher of hot water with pillows around it on a bed, so that the patient can lie

down and hold the ear over it comfortably for an hour at a time. During all intervals a large cotton pad, covering the whole side of the head, is to be worn.

Next, what can be done after an opening has been made either by rupture or incision of the drum membrane. Up to this point the heat is most easily and effectively applied, as just described, but now a new necessity arises, viz.: the removal of the infective discharges which accumulate in the external auditory canal. If they are not removed they may, merely by mechanical obstruction, cause accumulation behind the membrane and extension of the process in that way.

The prime necessity at this stage is some simple method which the nurse or friends can carry out, and with which they will not be liable to do harm. After extensive trial of syringes of all sizes and shapes, after trying drainage tubes and many other so-called methods of drainage, I have discarded everything except one form of syringe, viz.: the ordinary rubber bag known as the fountain syringe. A two quart bag hung from two to four feet above the patient's head furnishes a uniform stream gentle enough to avoid the danger of forcing infective material in beyond the tympanum and with force enough to cleanse the external auditory canal. If done often enough, it will also keep the opening in the drum membrane free from obstruction, and my own rule is to have it done often enough to accomplish this very desirable result. In a few threatening cases, where the opening in the drum membrane was with great difficulty kept free, I have even gone so far as to order the two quarts of hot water every half hour during the entire twenty-four hours for several days in succession, but I most frequently order it about once an hour and during waking hours only. This, of course, makes a lot of work for somebody, but it must be borne in mind that bacteria work twenty-four hours every day, unless interfered with.

In addition to the cleansing power of all this hot water, I have no doubt that the heat radiated from it so raises the temperature of the tympanic cavity as to exercise an adverse influence on bacterial growth.

Cases of acute infective otitis carefully watched with mirror and speculum and treated in this thorough way uniformly do well, except the otitis caused by the tubercle bacillus, which is nearly or quite incurable. Cases of infective otitis which are let alone, cases which are treated with ear-drops, cases which get either ineffective or too forcible syringing, cases where the external auditory canal is plugged with powders, a considerable percentage of them do

badly and ultimately join the army of chronic "running ears," which we have always with us.

In dealing with chronic infective otitis the treatment is neither so simple nor so successful, but even here a majority of cases can be cured. The cleansing and anti-bacterial influence of large quantities of hot water is just as valuable here as in acute cases, but it is very difficult to get patients to submit to it, because we cannot give them the assurance of a quick cure. In fact, we must completely alter our prognosis. In any given acute case, even after perforation of the membrane has taken place, we can say to the patient, "This discharge can be stopped; you will recover your full hearing power," and in only a few cases will the prognosis be wrong. But to the chronic "running ear" we must say, "Perhaps we can stop the discharge, but you will not recover your full hearing power."

This brings us to a very much neglected fact, viz.: that other things being equal, the amount of deafness is directly proportional to the duration of the infective process. Acute cases usually demand attention as long as the pain lasts, cases with cerebral complications demand attention, but between these two extremes is a long line of patients with "running ears," to whom the nastiness and smell of the infective discharges are for a long time the most prominent features and who wake too late to the more important fact of the permanent impairment of hearing.

There is, of course, no hard and fast line between the cases which do recover normal hearing power and those which do not. In cases of equal duration there may be the widest difference in the amount of hearing lost, because more important parts of the conducting apparatus happened to be affected in one case than the other. In cases which seem to be exactly alike, both as to infected area and duration of disease, variation in the virulency of the germs or in the resisting power of the patient may lead to great loss of hearing power in one case and very little in another. Notwithstanding all this, notwithstanding the many causes at work and the difficulty of assigning to each its proper place, still the clear cut clinical fact is patent to all observers that acute cases, if treated, nearly all recover normal hearing power, and that in chronic cases, whether treated or not, a portion, or the whole of it, is uniformly lost. The explanation is not far to seek. How many joints in the body will stand continuous soaking in infective discharges and not get stiff?

The tympanic cavity is lined with thin mucous membrane, united almost inseparably to thin periosteum. The three little ossicles are covered throughout with these two membranes. When the cavity is full of fluid these three little bones are immersed in it, and we

have first an inflammation of the mucous membrane and then a periostitis, which may involve all the periosteum of each bone. After months of this the deposit of cicatrical tissue is, of course, a certainty, and an almost microscopic quantity of it in some places, as, for example, around the footplate of the stirrup, may seriously and permanently interfere with the transmission of sound vibrations. Patients persistently ascribe all their deafness to the hole in the drum membrane, but both the hole in the membrane and the thickening of what is left of it are usually minor factors. The real obstruction is in the joints of the ossicles or in cicatricial bands which produce too great tension on some part of the conducting mechanism.

The successful treatment of chronic infective otitis, and by success I mean merely the stopping of the discharge, often demands all our resources. At one extreme, however, we may have a case like the following: Mr. L—, age 55, consulted me first on June 2, 1884, and gave the following history: Scarlet fever when a child, and had been deaf ever since. After running for some weeks, the right ear stopped, but the left ear had run pretty much all the time, *i. e.*, for over forty years. The lower two-thirds of each drum membrane was gone. For two weeks I carefully cleansed and disinfected the left tympanic cavity every day, there being no discharge after the tenth day. During the next year he had two relapses, which were each stopped in less than a week. I was able to follow the case for eight years, in which he had no relapse, and so far as I know, he has had none up to date.

At the other extreme, every aurist, who does not drive them away, has cases which resist every known method of treatment. Perhaps the most important advance in treatment is the more frequent removal of one or more of the ossicles, to facilitate drainage or to get at granulations which could not otherwise be reached, or where the ossicle itself is carious and must eventually come out anyway. In cases where the hearing is considerably impaired, this cannot only be done without increasing the deafness, but in some cases the hearing power is actually increased. At first thought this seems incredible, but if removal of the ossicle makes all the difference, and it sometimes does, between good and bad drainage, it is not difficult to imagine that swelling of the parts might go down and the general condition of the cavity so improve, that what was left of the conducting apparatus might act better than before the removal.

The choice of an antiseptic in these cases is, in my opinion, of much less importance than the skillful and patient persistence of the

man who applies it. Antiseptics strong enough to sterilize the whole cavity are out of the question, and this makes it all the more important to be thorough, yes, even fussy, with the weaker solutions. In cases where the perforation is large and the amount of discharge small, and we have reason to believe that we can reach all or nearly all the infected surface, the use of powders instead of solutions sometimes hastens the cure. If the discharge, however, is at all abundant and if we do not reach all the infected surface, we are merely obstructing the flow outward, causing it to accumulate and perhaps cause an extension of the infected area. My own rule is to use them chiefly at the end of the treatment, when the case is nearly well, and I am sure that I often save time in that way. But even here I have met another difficulty, viz.: to have the patient omit the last visit for the final removal of the powder, and weeks or months afterward have an attack of otitis caused by the old plug. So that the only safe rule is to have the patient distinctly understand that the powder must be taken out as well as put in.

Finally, we come to the more serious end of the business, to the cases in which the process extends beyond the tympanic cavity, and begins to threaten life as well as hearing. In May, 1894, I read a paper on this part of our subject before the American Congress of Physicians and Surgeons at Washington, and these were the opening sentences: "When pus leaves the tympanic cavity upon its infective mission, its paths are very devious. There seems to be absolutely no direction in which it cannot go. Veins, arteries, lymphatics, nerve sheaths, labyrinthine fluid, all at times become common carriers for this bacterial army." You will please notice the confusion of pathological ideas. I begin by laying all the harm to the pus and end by accusing bacteria. I should have said, "when bacteria leave the tympanic cavity upon their infective mission," etc.

This chapter of otology is a rapidly increasing one. During the last five years more than three-quarters of all the papers and discussions before the American Otological Society, before the New York Otological Society, and before the Otological Section of the New York Academy of Medicine, have been upon this subject. MacEwen, of Glasgow, has written a classic of 354 pages upon it, and no one who has followed the drift of the papers and discussions, can have any doubt that a definite and positive advance has been made in the possibilities of surgery in this region. Ten years ago, tenderness, redness and swelling over the mastoid were almost necessary symptoms without which surgical interference would not be justifiable. To-day, while not without value, they are of minor importance, and a case of chronic infective otitis, with sudden rise of

temperature and other symptoms of constitutional disturbances, calls much more loudly for operative interference if the mastoid is normal externally than if it is red, tender and swollen, and for this reason, it is usually found that in those cases the external table of the mastoid is so thick that if the infection is to extend at all, it must extend inward.

Again, much stress used to be laid on the importance of distinguishing between sinus-thrombosis, lepto-meningitis, and abscess of the brain, before the operation. Now the idea is coming more and more to the front that the important thing to decide is whether anything is going on, whether any form of extension of this infective process is taking place, and, if it is, to open the bone and make the special diagnosis during the operation.

In cases of sinus-thrombosis, an entirely new surgical principle has been established, viz. : that one of the large cerebral sinuses (the lateral), if it contains a septic clot, can be laid bare, slit open, curetted, and rendered aseptic, not only without harm to the patient, but as a direct means of saving his life. Before this fact was received as a fact, it was not so very uncommon to see a so-called mastoid operation abruptly stopped in great trepidation, because an accidental opening had been made into the lateral sinus. Again, the word meningitis is not a word much connected with favorable prognosis, and it has for years been a practically unanimous opinion that infective lepto-meningitis, once started, was always fatal. This, also, is now being questioned, and there are a considerable number of well authenticated cases in which a small area of lepto-meningitis did not spread after the operation and the patient recovered. The list of cases of abscess of the brain, moreover, treated successfully by surgical interference is a constantly increasing one, and while the brain power of these patients after recovery is perhaps not all that could be desired, the condition after abscess averages a little better than the condition after the removal of tumors of the brain.

In conclusion, you have already noticed that no word of doubt has crept into my statements as to the bacterial origin of all the harm which is done by this infective process. This is not an absolutely demonstrated fact. All that has been absolutely demonstrated is the continued presence of the bacteria at all parts of the process. But taking everything into consideration, it seems so probable that I have ventured to make the statements in that way. The agency of bacteria has been demonstrated in other parts of the body, and they seem to behave in a similar manner here.

Then, again, cases of infective otitis behave differently when different varieties of bacteria are more numerous. The most radical

difference in behavior is when tubercle bacilli are present in great numbers. These cases are usually painless and incurable, while all other kinds of acute infective otitis are usually painful and curable. Again, streptococcus cases are more likely to spread to the deeper structures of the head than, for example, those in which the staphylococcus predominates. So that the only really credible working hypothesis is the bacterial, and I have no doubt that, at no very distant day, the demonstration will be complete and that we shall have a bacterial nomenclature for the different parts of the process.

TREATMENT OF HEADACHES.*

BY ROBERT E. PECK, M.D.

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There is probably no symptom or disease which demands more careful investigation on the part of the physician, for its relief, than headache, and before we can speak of its treatment, we will first consider the mode of occurrence, causation and pathogenesis.

The term "headache" is applied to any form of head pain, and has been variously classified, by different authors, according to the character of the pain, location, etc. The following classification, suggested by Collins in a recent paper on the subject seems to be a radical and convenient one: (1) Migraine: An individual disease like epilepsy; a neurosis of a degenerative type. (2) Neuralgia: including tic-douloureux, supra-orbital, occipital and nuchal neuralgia. (3) Syptomatic headache: an indication of functional or organic disease, traumatic, accidental, or inherent. (4) Idiopathic headache: a rare form of cephalalgia which has no determinable association with organic or functional disease.

Some information is to be gained from almost any method of classification, and, while a careful consideration of the location and character of the pain is of much value, it is not safe to place too much dependency upon this method of interpretation. A few years ago all vertical headaches were considered of uterine origin; while now, headaches that are believed to originate in some form of disturbance of the uterine function are referred to the occipital region.

Headache may be, (1) a symptom of functional nervous diseases, as neurasthenia, hysteria, and epilepsy, or (2) a symptom of organic brain disease, as brain tumor or abscess, of a meningitis, or encephalitis. (3) Result of trauma; as in injuries to the scalp or bones, producing surgical conditions, or, where no such result is produced, they may be due to pachymeningitis or are the symptoms of traumatic neurasthenia. (4) Due to disturbances of the circulation, which lead to an anæmic or hyperæmic condition of the brain. (5) An indi-

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cation of intoxication, the sources of which may be endogenous, that is, the intoxication or infection arising within the system, as in uremia, or in some form of intestinal disturbance; or exogenous, as by alcohol, nicotine, metallic poisons, malarial infections or the infectious diseases, etc. (6) Due to causes which operate reflexly to cause fatigue and exhaustion, as the insufficiencies of the ocular muscles, errors of refraction, etc. (7) A manifestation of a local rheumatic involvement of the cranial muscles, as a myalgia of the temporal or occipito-frontalis muscles. (8) Besides these, there remains a variety of headaches which cannot be classified under any of these captions, and are probably forms of neurasthenia of a degenerative type.

Probably the most common form of headache that the general practitioner is called upon to treat is that due to or accompanying the neurasthenic state. The pain is usually limited to a band about the head at the vertex, or to the occipital region, is worse in the early part of the day, when the patient feels the worst and wearing off towards evening with the feeling of well being, so common in most neurasthenics. The pain is increased by mentation and any excitement and is described as a feeling of pressure or a drawing sensation. These patients usually present the ordinary physical accompaniments of the neurasthenic state, the excitable, but easily exhausted tendon reflexes, disordered digestion, constipation and impaired assimilation.

Hysterical headaches are comparatively rare, and are described by the patient as a feeling as if a nail were being driven into the head at the vertex. The condition is accompanied by the mental and physical stigmata of the neurosis, such as the disturbance of the special senses, particularly hyperæsthesia and anæsthesia, convulsions, paralysis and contractures, disturbances of interlection abscessions and compulsions. Headache, as accompanying the degenerative neurosis epilepsy, may be the equivalent of the convulsive attack or precede or follow it. In those cases where the headache replaces the attack it is followed by great prostration; but when it is preconvulsive it is of the nature of an aura and is then shortly followed by a convulsive seizure. Following the attack, the headache is of the nature of a soreness and accompanied by some mental confusion and drowsiness.

With the probable exceptions of syphilis and the neurasthenic state, there is no other one condition in which headache becomes so severe and constant a symptom as brain tumor. The character of the growth has little of value as a diagnostic feature, except it be that gummata are more apt to be accompanied with pain, but the

location of the pain corresponds more or less with the location of the neoplasm. Tumors of the cerebellum are almost invariably accompanied by either occipital or brow pain. The pain is of a dull, gnawing or boring character, and sometimes lancinating and agonizing, and is more or less continuous, but subject to exacerbations; it is increased by jarring the head. Upon tapping the head with the finger tips there is often localized tenderness of the scalp. The association of the pain with other symptoms, such as vertigo and vomiting, make the diagnosis. Headache is one of the most constant symptoms of brain abscess and is often so severe as to cause intense suffering, worse at night than early in the day. The pain is diffuse if the neighboring meninges are much inflamed, or may be more or less localized, according to the site of the injury. Cerebellar abscess may be accompanied by pain in the occipital or frontal regions.

Headache is a prominent and often a distressing symptom of all forms of cerebral meningitis, both acute and chronic. In the acute stage it may be localized to the region from which the infection originates; it soon becomes diffuse, however, and is associated with nuchal rigidity. S. Weir Mitchell, in his article on "Permanent Headaches," in the *International Clinics*, speaks of the probable origin of a certain number of permanent headaches, in limited areas of adhesion of the dura to the calvarium. He gives as probable causes, trauma, which in the young may be comparatively slight.

Following trauma, headache is a very constant symptom, and where it follows concussion or laceration of the brain tissue, is usually severe and continues for some time; it may be localized at the site of the injury or at the opposite side of the head.

Headache, which is so common an accompaniment of cerebral hyperæmia and anæmia, is now almost universally conceded to be symptomatic of some pathological condition in other parts of the body, and is, consequently, associated with other symptoms. The pain of cerebral anæmia is usually confined to the forehead and eyes and is associated with a distressing sensation of pressure in the occipital region and vertigo; it is a variable quantity, but sometimes of almost intolerable severity.

Toxæmic headaches, as we have said, have their origin either in some toxic substance produced within the system, or introduced in the form of alcohol, lead, or certain other drugs, from without. There is really very little in the headaches of toxæmia and auto-toxæmia to distinguish them from other headaches, except it be that they are more often situated in the frontal region; this is especially true of the headaches of auto-infection and those of lead. The occurrence of headache in those who use tobacco, alcohol, tea and

drugs, and in those who are exposed to the absorption of lead, arsenic, mercury, phosphorus, etc., lead one to suspect their origin. We are perhaps all of us familiar with the headache following an excess of alcohol, what the Germans call "Katzen-jammer;" in this form of headache, as well as those due to the absorption of lead, vascular changes probably play a secondary part in the causation of the pain. More than a few varieties of headache are associated with disorders of the digestive apparatus. Besides the presence of the products of improper and incomplete digestion and assimilation, there are other factors which enter into their production, namely, the diminished blood pressure, general and local anæmia and reflexly, from distention of the gastric and intestinal walls. These headaches are generally frontal, often immediately over the brow, and described as a confused, apathetic feeling.

Headache is the most frequent prodrome of infectious diseases, but with few exceptions, as in syphilis, influenza, malaria, and epidemic cerebro-spinal meningitis, they have nothing to distinguish them.

Headache is an important symptom of syphilis and occurs in the stage of eruption and as a tertiary manifestation. In the former it is an indication of the general infection and is independent of any coarse nerve lesion; the pain does not differ from that of other infections and is not to be distinguished so much by its location as by being worse at night. During the day it diminishes in severity, or disappears, and is not infrequently accompanied by manifestations of parietal periostitis. Headache accompanying the latter stages is, perhaps, of even more frequent occurrence, although this form has a decided predilection to be worse at night; it is more readily recognized by its association with vertigo, dementia, peresis, etc.

The variety of headaches known under the head of reflex, form a very important class, not so much from their frequency, but because of their amenability to treatment, if interpreted early, and their extreme sluggishness, if left to go for a long time. It becomes very important for the physician to investigate very carefully and have the cause removed before the headache habit is established.

The most common form of this variety of headaches, that resulting from eye strain, if allowed to run, becomes, in reality, a headache of exhaustion and is then not to be distinguished from that accompanying the neurasthenic state. The pain is usually limited to the frontal region or to a very circumscribed area of the occiput and occurs or is made worse by using the eyes, and is relieved by resting them and by anything that temporarily paralyses the accommodation. They are never present on arising in the morning.

Next in frequency are the reflex headaches due to some derangement of the pelvic organs, particularly posterior displacements and cervical lacerations. These two are forms of exhaustion headaches, the pain being usually neuralgic in character and occurring most frequently in the occipital region, and is associated with tenderness of the cervical region and with "weak back."

Headaches having their origin in nasal catarrh do not occur unless associated with ethmoiditis, or inflammation of the frontal sinuses. Nasal headaches are probably caused by the irritation of some of the branches of the trigeminus by the swollen mucous membrane. The pain is located in the frontal region at the base of the nose and is of a dull, boring character and relieved by the inhalation of pungent substances; is more or less continuous, but worse in the morning upon arising, and until the patient has had a bath and breakfast and the circulation is temporarily invigorated.

Enough has already been said about the diagnosis of different varieties of headaches without going into further detail, but I wish to emphasize one or two points which we should always bear in mind in making a diagnosis. Much can be gained in the interpretation of head pain by careful attention to its location; not that every headache from eye strain or that of neurasthenia is confined to the same area of the head, but that the average of the cases of headaches from such causes are localized either in the frontal or occipital regions. Much can be gained also by a consideration of the character of the pain, its duration, mode of occurrence, etc. After all these points have been carefully taken into account, then the final diagnosis must be made by a process of exclusion, and it is first necessary to exclude the cephalic pain of migraine and neuralgia. After this has been done, it becomes our duty to consider the fact that cephalalgia may be due to any disease of the cranial bones and their cavities, such as inflammation of the muscles of the head, caries of the bones or diseases of the frontal sinuses.

From the fact that headache is so constant and troublesome a feature of brain and meningeal affections, it becomes a very important factor in making a diagnosis to exclude these diseases.

Finally, after the condition of the blood and blood vessels have been investigated to eliminate any source or evidence of intoxications, the neuroses, neurasthenia, epilepsy and hysteria only are left to be excluded. After a diagnosis has been made the treatment of the headache resolves itself into the relief of the symptom and then the removal of the cause. I do not propose to go in detail into the treatment of headaches resulting from malarial infection or those due to poisoning in uræmia or by alcohol, tobacco and the metallic substances, or rehearse to you the methods of administering phena-

cetin or the other coal-tar derivatives, but wish to call your attention to a few points in the treatment of neurasthenic headaches. For the relief of the neurasthenic state, the measures comprise intelligent rest, exercise, change of surroundings and improvement of the nutrition, through appropriate medicinal measures, diet, hydric procedure, massage and electricity.

I shall speak more in detail regarding the hydric procedures, because they are less familiar to most of us. Where no apparatus is at hand, the application of water at a temperature of from 75° to 50° F., to the chest, back and abdomen, from the hollow hand of an attendant, will be found of great value, but where access to a hydriatic institute is to be had, the best results will be obtained by the use of the ordinary douche, with water at 80° to 50° F., and at a pressure of from ten to twenty pounds to the square inch, the temperature to be diminished while the pressure is increased, at each sitting until the limit of the reactive power of the patient has been reached; this is to be followed by the needle spray. Before carrying out this procedure, the patient's blood vessels should be dilated by incasing him in a hot air box, for from three to five minutes. After the administration of the douche, the patient should be made to walk briskly in the open air for about twenty minutes. What has been said of the treatment of neurosis neurasthenia, also applies to the treatment of headaches of the hysterical state.

The treatment of headaches which precede or replace the attacks of epilepsy, calls for the methodical administration of the bromides, in addition to the usual dietetic and disciplinary measures.

I desire to call your attention to the method of treating migrainous headaches, which has been recently suggested by Dr. Herter, and consists in washing out the stomach, whether it contains food or not, with water at not less than 105° F. This procedure relieves the pain and occasionally, when applied at the beginning of the attack, will abort it. Where lavage is inconvenient, the patient should drink hot water. After the stomach washing, the patient should be given a rapidly acting cathartic. The rationale of the method is not apparent, but it is possible that in migrainous subjects the tolerance of the nervous system is suddenly exhausted, and hence, the removal of a small quantity of toxic material from the stomach may be sufficient to influence the attack.

Dr. Herter believes that in persons subject to attacks of migraine there is a disease of the nervous system, which predisposes it to the irritating effect of certain poisons, particularly such as are produced in the alimentary canal by the action of bacteria and by the imperfect digestion of the proteids.

SURGICAL SHOCK.*

By H. G. ANDERSON, M.D., Waterbury, Conn.

Shock is a name given to a condition presenting, more or less constantly, the following group of symptoms: (1) An appearance of great general prostration; (2) General muscular relaxation; (3) Surface pale and covered with cold perspiration; (4) Generally mental apathy, but sometimes increased acuteness; (5) Pupils and nostrils dilated; (6) Respiration feeble and short or sighing in character; (7) Low arterial tension; (8) Pulse rapid and weak or imperceptible; (9) Dulled sensation or anæsthesia; (10) Drooping eyelids; (11) Lowered temperature; (12) Loss of sensation in conjunctiva; (13) Suppression of urine; (14) Involuntary evacuation of feces; (15) Loss of power to swallow; (16) Vomiting, sometimes persistent.

The varying definitions given to this condition show the uncertainty with which the cause has been regarded. The International Encyclopedia of Surgery says: "Shock is a reflex paralysis, or reflex inhibition, affecting all the functions of the nervous system, and not limited to the heart and vessels only." Another is: "Shock is a paralysis of the heart and vaso-motor paralysis of the abdominal vessels, the sudden dilatation of which simulates sudden hemorrhage." (Robson.)

More recently, as experiments and study of the sympathetic nervous system developed more fully the knowledge on this subject, the question arose whether it is not more probable that shock is in no sense a paresis, but rather an excessive irritation of the entire nervous system, manifested mainly by the excessive stimulation of the vaso-motor constrictor nerves. Hence, "surgical shock is essentially due to a reflex impulse which is distributed, not merely to the cardiac and vaso-motor nerves, but to the entire vasa-motor system." (Boise.)

On this point, Dalton says: "The varying condition of blood-vessels under nervous influence is shown by an experiment in which the upper part of a rabbit's ear is cut off by a clean incision, allowing the blood to escape in jets from the divided arteries. The force

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and height of the jets having been observed, the sympathetic nerve is divided in the neck of the corresponding side. The blood at once escapes from the wounded ear in greater abundance and the arterial jets rise to double or triple their former height. (This shows evidently a condition of paresis.) The galvanic current is then applied to the nerve, above the point of section, when the stream of blood escaping from the wound diminishes or disappears, but it recommences when the galvanization of the nerve is suspended. (This, on the other hand, is a condition of stimulation.) The sympathetic nerves, accordingly, exert an influence on the muscular coat of the arteries similar to that of the cerebro-spinal nerves on the voluntary muscles. They cause contraction of these vessels—a diminished flow of blood through them—and, consequently, pallor and coldness of the corresponding parts.

On the other hand, division—paralysis—of these nerves causes relaxation of the arteries and all the secondary results of an increased supply of blood. This same condition obtains in the influence of psychical excitement, as speaking or fright, on the cessation of hemorrhage. Even in severe hemorrhage the acute anæmia acts upon the medulla as a stimulus, causing contraction of the small arteries, and lessens or stops the bleeding. Thus hemorrhage is often arrested as soon as unconsciousness due to the acute anæmia occurs.

The train of events in the production of the condition of surgical shock is, therefore, somewhat after this manner:

First, there occurs the injury—contusion, crushing of an extremity, or wounding of sympathetic nerve fibres in the abdominal cavity. The nerves about the injured region are strongly irritated, and an impulse of intense irritation passes along the afferent nerves to the corresponding reflex centres in the cord, which are strongly stimulated, and an efferent impulse is sent out over the entire sympathetic system. As a result of the stimulation of the vaso-motor constrictors, the arterioles are strongly contracted, causing the small thready pulse. The heart, being strongly stimulated, contracts strongly and rapidly and relaxes imperfectly, sending only a comparatively small amount of blood into the arteries. As a result there comes the acute anæmia of brain and cord, with partial suspension of their functions. The contracted arteries of the kidneys produce the suspension of secretion of urine sometimes seen in this condition. Most of the other symptoms enumerated can be traced to the general vaso-motor constriction. The dilated pupil is produced by the stimulation of the cervical sympathetic nerve. The

perspiration is probably caused by the irritation of the secretory fibres. The involuntary evacuations are produced by the cessation of voluntary control of the sphincters from the cerebral anæmia and the increased peristaltic action of the intestines.

Prognosis: This depends on the character of the injury and its location. Generally, the nearer the great centers—brain, heart or abdomen—the greater will be the degree of collapse. Many cases, however, are reported of even fatal shock from an apparently trivial injury. The mode of life is an important factor in determining the prognosis. Alcoholic, cocaine and opium subjects do not bear well any degree of shock. **Age:** In the very young shock is rapid and extreme, and recovery, when it occurs, is prompt and complete. In the old shock is less pronounced, but reaction is slow and uncertain. Nervous depression or fear of an operation may increase the collapse afterward. The lower the temperature the less likelihood is there of a favorable termination. Permanent deafness or chorea may follow shock, especially that of severe fright.

Treatment: Preventive: By avoidance of causes as far as possible. Some of these are: Prolonged operation; hemorrhage, either rapid, or continuous oozing; chilling, or unnecessary wetting of the surface of the body; the action of an anæsthetic given on several successive days.

It is important to take into account the personal element or idiosyncrasy, as shown in the case of highly organized nervous temperaments. To such cases words of cheer and encouragement before operation are of more value than much strychnia later. Before operation whiskey should be freely given for several hours. A hyperdermatic injection of one-eighth grain of morphine will render the general nervous system more quiet and less liable to irritation. The period of anæsthesia should be as short as possible, occasionally allowing the patient to recover enough to move slightly, and if the dressing is not to be painful, suspend the anæsthetic entirely.

To aid recovery from shock those drugs are to be used which have a strong and direct action on the nervous system:

1. Inhalations of nitrite of amyl. This is the most rapid of all the remedies at our disposal to overcome the condition described. Its effect is rapid in relieving the arterial constriction and causing pallor to be replaced by flushing. The effect is only of short duration, however, and its use must be repeated or the use of another drug of more lasting effects may follow it.

2. Nitro-glycerin acts in the same way, i. e., it relaxes the arteries and relieves the overburdened heart.

3. Opium, in the form of morphine, is of decided benefit by giving quiet and sleep.

4. Strychnia is one of the most valuable agents at our disposal in shock from whatever cause. The action of strychnia is almost, if not quite, entirely confined to the cerebro-spinal nerves. The vaso-constrictor nerves are non-medullated and arise from the cells of the sympathetic ganglia. Accompanying the vaso-constrictor sympathetic fibres there is a vaso-dilator medullated fibre arising from the anterior column of the spinal cord which is lost in the muscular coat of the arterioles. Strychnia stimulates this spinal nerve and so counteracts or overcomes the constriction. H. C. Wood says: "It has been shown that the primary stimulation of the vaso-motor centers by strychnia is followed by a fall of arterial pressure and vaso-motor paresis." Also that "very large doses produce an immediate depression of the vaso-motor centers and fall of arterial pressure."

5. By the mouth may be given champagne, whiskey or small doses of aromatic spirits of ammonia.

6. Dry heat: This is one of the most effectual measures to be taken. Hot water bottles, plates, bricks, or blankets should be placed all about the patient.

7. Friction, bandaging of the extremities, mustard paste over the heart—all these are of value.

8. Last in this list, but one of the first in importance, especially in shock from hemorrhage, is the infusion of warm saline solution. This may be injected into the rectum, or, in more urgent cases, should be thrown very slowly into a vein, or injected by means of a large syringe into the loose connective tissue of the thigh or breast. Whatever method is selected to introduce it into the circulation, the quantity should be large—from one to three pints. Goffe reports having used five quarts in one case with satisfactory results.

The old question of operation during shock need not be discussed here; it is sufficient to remember the rule to do nothing which will in any way tend to increase the collapse.

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WE take pleasure in announcing the election of James Francis Quinn, of the Junior class, as an Associate Editor of the YALE MEDICAL JOURNAL.

* * * *

THE cordial reception which has greeted the circular of the Bi-centennial Committee and the substantial returns which are already flowing in suggest a word to our readers in behalf of the Bi-centennial movement in general, and more particularly in regard to the need of endowment for the Medical Department. The names of more than seven hundred medical men are in the list of alumni of Yale. If every one of these should contribute at this time, and should designate his subscription as for the Medical Department, material aid would be afforded in the development of this department of the University. During the past decade no department of the University has experienced such rapid and extensive development as the Medical School. When we attempt to discover the causes which have led to this extraordinary development, two factors stand out in special relief—consistent raising of the standard of

scholarship and continual increase in the opportunities afforded students to acquire here a thorough training in medicine. With elevation of the standard has come increase in the number of those desiring to avail themselves of the opportunities offered. Now, the point we would particularly impress is the fact that with the increase in the number of students and with the lengthening of the curriculum to four years, both necessitating very considerable increase in the amount of instruction provided, there has been no commensurate increase in the financial resources of the Medical School. That the tide is turning in the right direction is evident from the recent addition to the endowment fund of the Medical Department of the Bliss and Hunt bequests, the former of which was left to be applied by the President for the best interests of the University. If, then, in spite of financial embarrassment, the growth of the Medical School has been so considerable, may we not expect that with greater resources and consequent greater opportunity for affording the highest type of medical education there shall be even greater development in the future? That, with such development, advantage must accrue to the University as a whole, is admitted by all. As aptly put by Prof. William H. Welch in the annual address in medicine, delivered at Commencement in 1888: "In no other direction could this University expand with greater promise of usefulness and of renown than in the line of liberal support of the highest and most scientific medical education." This, under the lead of Professor Welch, has been developed at Johns Hopkins, and has there brought great renown, the world over to the University. Nothing except financial embarrassment stands in the way of similar development at Yale, with its consequent reflection of credit to the whole University. The present time seems to us particularly appropriate to the wide circulation of these facts in the hope that the medical alumni of Yale may be led to add their subscriptions in honor of Yale's Bi-centennial to the endowment fund of the Medical Department. That designation of the purpose to which subscriptions may be made is intended by the committee is manifest from their publication of a list of the special needs of the University at this time. Reference to this list will show two items particularly applying to the Medical Department: Clinical Building and Pathological Institute, for which \$100,000 is required; and Fund for Instruction, for which \$200,000, a sum urgently required for immediate needs, is asked. May not each medical alumnus of the University be relied upon to assist in the accumulation of these funds?

MEDICAL SOCIETY REPORTS.

A regular meeting of the New Haven Medical Association was held on Wednesday evening, April 5, 1899. The President, Dr. F. W. Wright, occupied the chair. There were present, as guests, Drs. Holbrook (East Haven) and Briggs (New Haven.)

Dr. McCabe read the paper of the evening entitled "Eye Strain." This was discussed by Drs. Swain, Alling and Tuttle.

The following gentlemen were unanimously elected to membership in the Association: Drs. D. R. Hinkley, H. H. Briggs, C. H. Robbins, A. G. Nadler, H. Oertel, E. F. McIntosh, J. S. Ely, and W. J. Butler.

Upon motion by Dr. Eliot, it was voted that the President be authorized to invite Dr. Wiggin, of New York, to be present at some meeting this spring and read a paper. The report of the Question Committee was read, and the meeting adjourned.

A regular meeting of the *New Haven Medical Society* was held on Wednesday evening, April 19. Vice-President Alling occupied the chair.

Dr. Seaver related the case of a young man whose patella was fractured by a blow from a hockey stick, but who had continued to use the leg more or less for a week before coming under observation. A figure of eight bandage over the knee was found sufficient to keep the fragments in fairly good apposition, and after six weeks there was only slight movement of the fragments. The fracture, which was transverse, was so low on the patella that many of the lateral fibres of the ligament aided in maintaining the function of the ligament as a whole.

Then came the reading of the paper of the evening, by Dr. S. J. Maher, entitled "A Case of Puerpural Septicæmia." The paper was discussed by Drs. Foote, Bartlett, Alling, Verdi, Hotchkiss, Oertel and Hinkley.

The Question Committee reported that Dr. Wiggin, of New York, would read a paper at the next meeting on Malignant Uterine Disease.

THE ONE HUNDRED AND SEVENTH ANNUAL MEETING OF THE HARTFORD COUNTY MEDICAL SOCIETY was held in the Hunt Memorial Building, at Hartford, on Wednesday, April 19.

The meeting was largely attended and enthusiastic throughout. The President, Dr. James Campbell, presided. The Clerk's report showed the Society to be in a flourishing condition, with a total membership of 141. Drs. G. E. Shepherd, N. Mayer and P. H. Ingalls were appointed by the chair as a Committee on Nominations. Dr. W. C. Havens, of North Coventry, was present as a representative of Tolland County Medical Society, Dr. E. Pratt, of Torrington, represented Litchfield County, and Dr. T. M. Hills, of Willimantic, Windham County.

The first paper of the day was that of Dr. E. K. Root on "Differential Diagnosis of Cardio-Vesicular Murmurs." Dr. Root is an examiner for the Connecticut Mutual Life Insurance Co., and he presented an important point, from the standpoint of an expert. He referred entirely to a functional murmur heard at the apex, systolic, soft and blowing, changed by respiration and not constant. The murmur is not transmitted and does not indicate any cardiac lesion. He suggested that it may be caused by the rythmical crowding out of air from the neighboring alveoli of the lung, which overlies the heart. This murmur may be mistaken for mitral or tricuspid insufficiency, for a hæmic murmur or for a pericardial friction rub. Lack of hypertrophy and non-transmission of murmur throw out mitral disease. Lack of dilatation of right auricle throws out the tricuspid. No visible anæmia, or, at least, an examination of the blood will rule out hæmic murmurs, while the friction rub can best be excluded by the history—no pain, fever, etc.—and by taking care that the stomach is not at the time distended so as to lift heart up. The true cardio-vesicular murmur can be wholly obliterated by having the patient hold his breath. In discussing the paper, Dr. G. E. Shepherd called attention to the possibility of meeting a heart which had just started on an organic disease and in which no hypertrophy was present, so emphasizing the necessity of repeated examinations.

Dr. E. P. Swasey then made a report of three cases of incarcerated femoral hernia, all operated upon in private houses and all recovering. The first was wholly an epiplocele, the second an enterocele and the third enterocele with the gut gangrenous, requiring resection and an end to end anastomosis. In discussing the paper, Dr. E. J. McKnight referred to a case of strangulated femoral hernia with gangrene of the gut, in which an end to end anastomosis was done, but the patient died on the fourth day from gangrene of the gut at the point of anastomosis, due, as he believed, to taking too broad a "V" out of the mesentery.

Dr. F. T. Simpson made the County report, which consisted of a summary of 42 cases of cerebro-spinal meningitis, of which 31

had proved fatal. He did not believe the disease as it now occurred could be called contagious, but in the discussion mention was made of three fatal cases, one after the other, in one family, in which contagion seemed clearly to have been a factor.

Dr. E. G. Fox read a short obituary on the death of Dr. Roswell Fox.

Dr. A. E. Abrams then read an essay on "Pneumonia," in which he emphasized the contagious nature of the disease, with the report of five cases, of which he believed three, and possibly four, could be traced to infection from the first, and he made a plea for better protection of attendants on pneumonia patients and their families.

Gen. Joseph R. Hawley was the guest of the Society at its afternoon session, and told many medical reminiscences of the late war, after which he was unanimously voted an honorary member of the Society.

Dr. E. J. McKnight reported a case of polydactylism. It occurred in the fourth child of the mother in whose family history there had never been a deformity. The thumb of one hand was replaced by three small fingers, each with a separate metacarpal bone. Two of the fingers were removed by operation, and the child is rapidly learning to use the other as a thumb.

Dr. J. E. Root reported the very interesting case of a "Fracture of a Cervical Vertebra with Recovery." The patient — a short, thick set man of 67 years, and weighing 219 pounds — was pitched off the end of a load of hay, striking fairly on his head, which was driven into the soft ground up to his ears. When picked up he was entirely paralysed, with the exception of the organs of speech. The neck was shortened and looked as if driven into the body. Manual extension was practiced, with the result that the patient soon began to move his hands, and then his feet and in a few moments walked up stairs to his bed. Temporary splints were applied and the next day a plaster cast was put on over head, neck and shoulders, padded in such a way as to maintain gentle extension. This was worn about a month. At present the patient is three-fourths of an inch shorter than before the accident, and his neck measures one and one-half inch more in circumference, but he has the full use of all his limbs and can execute nodding motions with his head, but has no power of rotation, although he allows passive rotation without pain.

The following new members were then elected: William Coyle, Windsor Locks, Buffalo Medical College, 1885; Philip P. Carlon,

Hartford, University of New York, 1890; William Gibson Craig, Hartford, Jefferson Medical College, 1892; William Sanford Kingsbury, Glastonbury, Yale Medical School, 1896.

The officers elected for the coming year are: President, Dr. J. A. Coogan; Vice-President, Dr. W. T. Bacon; Clerk, Dr. W. E. Dickerman; Censors, Drs. S. W. Irving, J. B. Hall and H. O. Allen; County Reporter, Dr. E. K. Root.

The annual meeting of the New Haven County Medical Association was held at the New Haven House, New Haven, Conn., April 20, 1899. The meeting was called to order at 10.45 by Dr. O. T. Osborne, President of the Association, after which the minutes of the last annual meeting were read and approved.

The Committee on Credentials reported, and the following were elected members: P. F. Metz, M.D., New Haven, New York University, 1893; H. R. Oertel, M.D., New Haven, Yale, 1894; E. T. Sharpe, M.D., Derby, New York University, 1895; D. R. Hinckley, M.D., New Haven, Harvard, 1896; M. J. Sheahan, M.D., New Haven, Yale, 1896; M. L. Loeb, M.D., New Haven, Yale, 1897; E. F. McIntosh, M.D., New Haven, Yale, 1897; W. N. Winne, New Haven, New York University, 1897.

No report was submitted by the Committee on Public Hygiene.

Dr. Townsend reported the death of three members of the Association since the last annual meeting.

The question for discussion was Albuminuria. Dr. Tuttle read an ably prepared paper, which was warmly received, on "Prognostic Value of Albuminuria in Chronic Nephritis." The paper was discussed by Drs. Eliot, Moody and Fleischner, after which it was referred to the Committee on Publication:

Dissertations were presented by Dr. Cahill and Dr. Peck. Dr. Cahill's subject was "Life Insurance Examination," and was based upon his own personal experience as a life insurance examiner. Dr. Peck presented the subject, "Headaches." Both subjects were discussed, the former by Dr. Carmalt, the latter by Drs. Alling, Mailhouse, Wurtemberg, Eliot and Fleischner and were then referred to the Committee on Publication.

Dr. Rodman, of Waterbury, whose paper was temporarily postponed, presented the subject "Albuminuria in Life Insurance." The paper was then discussed by various members present and also referred for publication.

In the election of Fellows and Alternates the choice was as follows: First Fellow, Dr. W. H. Carmalt, New Haven; Second,

Dr. H. Fleischner, New Haven; Third, Dr. W. P. Wilson, Waterbury; Fourth, Dr. F. H. Wheeler, New Haven; Fifth, Dr. A. A. Crane. Alternates: Dr. F. A. Benedict, Seymour; Second, Dr. C. A. Tuttle, New Haven; Third, Dr. A. G. Nadler, New Haven; Fourth, Dr. M. Smith, New Haven; Fifth, Dr. J. F. Barnett, West Haven.

Dr. C. S. Rodman, of Waterbury, was elected to fill the vacancy in the Executive Committee. The meeting was then adjourned.

MEDICAL PROGRESS.

THE ACTION OF DIPHTHERIA TOXIN ON THE NERVOUS SYSTEM.—(*Medical Record*, March 11.) Drs. Luisda and Pacchioni report the results of a number of experiments made upon dogs with the diphtheria toxin. Their results are as follows: The diphtheria toxins, applied directly to the nervous system, provoke a profound lesion at the point of application, characterized by an inflammatory and degenerative action. These lesions are propagated more or less extensively from the point of application. In the non-immunized dogs, which had been injected with a dose sufficiently toxic, the phenomena of local reaction were noted. In the immunized dogs the toxins constantly produced alterations in the nervous system, intense, localized, but of less extent than those produced in non-immunized dogs. The toxins applied directly to the medulla are propagated rapidly in all directions, preferring the posterior column, the gray matter, and the central canal as routes. In consequence of the bulbar invasion death occurred more rapidly in the animals when the toxins were introduced into the medulla than when applied to any other portion of the cerebro-spinal axis. When the toxins were introduced into the cerebral cortex, characteristic lesions of these regions were manifested. Death occurred later through propagation of the poison to the medulla. Toxins introduced into the sheath of the sciatic nerve produced an inflammatory action, more or less intense, but more circumscribed than in the central nervous system. From the nerves the poison ascended to the medulla, chiefly along the posterior columns, and so provoked an ascending myelitis. The lesions produced on the neuroglia by the direct action of the toxins is similar to that reported by Vassale, Danagglio, and others, in the various intoxications and infective processes. In the oblongata the principal changes are found in the crossed pyramidal tract and the posterior columns. The alterations produced by the

toxins affect the nerve fibre more than any other part of the nervous system. These lesions affect principally the myelin, and consist in a physical modification of it, whereby the connection between the nerves is lost. A chemical modification of the myelin is also partially present. The action of the toxins has much importance in the genesis of various paralyses as seen in the human family, attacking first the sheaths of the nerves, then the nerves, and later the nerve centers of the medulla.

THE OPERATIVE TREATMENT OF HERNIA.—(*Annals of Surgery*.) Drs. William T. Bull and William B. Coley gave a résumé of the results obtained in operating for hernia at the New York Hospital for Ruptured and Crippled. During the last three years 400 operations were performed for the radical cure of inguinal and femoral hernia; 352 were males, 48 females. Bassini's method, with kangaroo tendon, was the operation generally employed. Primary union was obtained in 373 cases, 3 died, 6 relapsed. Most of the cases have been kept under observation, with the following results: Of the 400 cases, 236 were well beyond one year, and 142 beyond two years. Of the three deaths, one only occurred from wound infection, one from pneumonia, and one from pericarditis. The methods employed in cleansing the skin are those usually adopted. Until the past year the hands were cleansed with green soap, hot water, alcohol, and bichloride of mercury, 1:1000; during the past year the chloride of lime method has been largely used, but the results were not materially better than before, 95 per cent. of the cases showing primary union. The patient is prepared by a full bath the day before, with thorough local scrubbing with green soap, and a soap poultice for four or five hours, then a moist bichloride dressing (1:3000) is applied and remains till the patient is anæsthetized. A final scrubbing with green soap, alcohol and ether is then given. For sutures, silk was used in two cases, with suppuration and relapse in both, chromicized catgut was used four times, simple catgut once. In 394 cases, chromicized kangaroo tendon was employed. This is recommended on account of its strength and pliability, but is expensive and difficult to obtain in proper size and of even calibre. Non-absorbable buried sutures almost invariably lead to the formation of sinuses, weakening the canal so that relapse follows. Fine catgut was employed for the ligation of arteries and for closing the skin incision. This is found absorbed at the end of one week. The catgut is prepared by boiling in absolute alcohol under pressure at 210° F. The dressings most used have been pads of iodoform gauze

and moist bichloride gauze (1:5000). A firm spica bandage is then applied, and over this a plaster of Paris spica, extending from the knee to the free border of the ribs. The plaster spica insures perfect rest for the wound, and, they believe, materially aids primary union. The complications are orchitis and injury to the cord. In no case was atrophy of the testis produced, although this was the chief objection raised against the Bassini method. Forty-eight operations were for inguinal hernia in the female. The operation employed has been practically Bassini's method for the male, with the single step of transplanting the cord omitted. Sixty per cent. were well over a year, 40 per cent. over two years. In femoral hernia the method employed has been high ligation of the sac and closure of the canal by a purse-string suture of kangaroo tendon. Dr. Coley has employed this method in twenty-five cases without a single relapse. In the cases of ventral and umbilical hernia the results were discouraging, 12 relapses occurring in 21 cases. In most cases relapse occurred during the first few months. If a case remains well a year the cure will probably be permanent. If it remains well two years it is almost always so. Indications for operation are: All young persons and cases not well controlled by a truss; cases complicated by fluid in the hernial sac; irreducible hernia; all cases of femoral hernia. Contra-indications are: Children under four years of age; adults over sixty; very large irreducible hernia, especially in stout persons. Of the methods for operation Bassini's seemed superior. The objections to Halsted's are the more complicated technique and the cutting of the internal oblique muscle, which cannot be again accurately approximated. Suture of the canal without transplantation of the cord has given good results in many cases. Success is dependent in no small degree upon the rapidity of operating, which permits of the least amount of bruising of the tissues, thereby contributing to primary union.

HOSPITAL AND CLINIC NOTES.

A CASE OF POLYSEROSITIS CHRONICA FIBROSA.—Reported by Leonard Woolsey Bacon, Jr., M.D. The patient's father was a laborer, who died at the age of 56, with a history of chronic alcoholism. His mother, age 50, is living and has always been healthy. She has borne eleven children, all of whom are well and hearty, except the patient.

The patient's previous history is as follows: At the age of 2½ years he had a severe attack of measles. At the age of 9 he suffered from dysenteric diarrhoea, which was attributed to indiscretions in diet and exposure to cold. There was no history of whooping cough, which is frequently found in these cases, and no other illness occurred except an accident at the age of 12, in which one eye was lost, and the patient was confined to his bed five or six weeks.

The patient is 20 years old, five feet ten inches in height, and weighed, before his present illness, 126 pounds. He began working a foot press at the age of 17.

In January, 1897, about one year after commencing daily labor, he felt badly, as he states, on the day following a dance. He attributed this to some ice cream and soda of the previous evening. This attack confined him to the house for two or three days, but he took a walk apparently before complete recovery, returned home and ate a hearty supper. The day following he had a high fever, his temperature going as high as 106°. This was accompanied by some rigors. After three days his temperature fell to normal. At the time this attack was diagnosed as malaria. The patient, however, did not recover for a long time. He was confined to his bed until March. He suffered no pain—and as far as is known, had no fever. There was a general malaise. On getting up he was able to move about the house by the use of a cane for three weeks, but was unable to get about without this support from sheer debility. For the next few weeks he was able to walk out doors without the assistance of a cane, but suffered from dyspnoea.

On Good Friday he went to a ball game and got thoroughly chilled. On coming home he noticed for the first time an oedema of the ankles, and a severe dull pain over the region of the liver. Two days constant vomiting subsided the pain. The patient noticed also a wheezing sensation beneath the sternum, and there was some cough associated with it. His trouble was diagnosed as acute Bright's disease at the time.

The patient was confined to his bed a month, but managed to get about considerably in the middle of August, 1897. The belly now began to swell. There was no oedema of the ankles, but there was great constipation. The stools were very hard, black in color, and passed in slender pieces about the size of a lead pencil.

On September 1, 1897, the patient went to the country for two months. While there the abdominal swelling was steadily increased. The oedema of the ankles returned about October 1. At that time the distress was very severe. There he was kept for the remainder of

the ascites with freedom of movements, the patient felt pretty well. On February 15, 1898, he walked down town, a mile or more, to consult a physician, simply on account of the ascites and œdema of the ankles, which came on whenever he walked about. This was treated chiefly by purgatives. He continued to feel pretty well, but the ascites increased constantly. The patient last walked down town in October, 1898. After that the ascites kept him confined to the house. His belly was enormously distended and very tense.

There had been no history of cardiac palpitation whatever at any time, nor the history of any trouble that was ascribed by the patient to the heart, which would lead one to suspect acute pericarditis.

The patient was first seen by Dr. Bacon, December 25, 1898. The abdomen was found so enlarged from ascites that there was absolute dullness, even when the patient lay on his back. The countenance was excessively pale, the temperature normal, appetite fairly good, and patient slept well. The stools had been kept loose by the use of jalap and rhubarb. On examining the urine its specific gravity was found to be high; it was acid in reaction; concentrated, but free from albumin, sugar, and tube casts. There was no valvular lesion of the heart. Upon these facts renal ascites was excluded and a provisional diagnosis of the tubercular peritonitis was made—with the recommendation of laparotomy.

On January 1, 1899, under the influence of chloroform, an incision was made in the median line. There was withdrawn twenty-nine quarts of a light, yellowish green, clear, fluid, which coagulated spontaneously. Great care was exercised to prevent collapse. One hour was taken for the removal of the liquid, and artificial respiration had to be resorted to several times. The incision was then enlarged to admit the hand, but nothing was revealed by the exploration. The incision was now enlarged to nine inches, and on vigorous retraction the liver was exposed. This organ was found to be normal in size, and about normal in consistency, but it was covered with a network of fibrin, the strands of which were about 1-32 inch in width. These interlaced to form a regular and distinct mesh-work, the spaces of which were about $\frac{1}{8}$ to $\frac{1}{4}$ inch in diameter. The regularity of this mesh-work was noticeable. The parietal peritoneum, serous coat of intestines, and appendix were in every respect normal.

On introducing the hand and palpating the spleen, it was found to be somewhat enlarged and, though not exposed to sight, was judged by the sense of touch to be covered by a net-work similar to that of the liver.

The abdominal wound was closed and healed by first intention. The patient's pulse remained constantly above 100° for a month. The diagnosis of polyserositis chronica fibrosa was made.

The urine was scanty and remained so in spite of various diuretics. At no time did it exceed a pint in twenty-four hours. After two weeks free fluid again appeared in the abdominal cavity. The appetite was good and stools regular. After the middle of March the patient was able to be up and about. On March 20, a careful physical examination revealed the evidence of a former pleurisy on the right and left side. There were friction râles in the left thorax, from the base of the lung to the sixth rib, and on the right side as far up as the fourth rib. There was no respiratory murmur below seventh rib on the right side. From this it was judged that there was pleural synechia on the right side.

The heart was displaced to the right; the apex beat could be neither seen nor felt. The left lung overlapped the pericardium more than normal. It was judged that there was more or less pericardial synechia. The cardiac dullness ceased at a point three-quarters of an inch inside the left nipple line, and cardiac flatness ceased about two inches inside of the same line.

At the present time the patient feels well, eats heartily, sleeps comfortably, and has gained in strength. His color has improved under the use of iron, but diuresis is scanty, averaging eight ounces per day. The ascites is increasing—the waist now measuring thirty-two inches. He is able to get up every day, and inasmuch as he walks about some, there is slight oedema of the lower extremities.

The disease seems to affect the serous membranes on either side of the diaphragm, and it appears to follow the course of the lymphatics. The right pleuritis and perihepatitis have appeared, in reported cases, to go pretty constantly together. The pericarditis is also a frequent concomitant. The left pleuritis and perihepatitis are more rarely formed.

It is questionable whether this is an inflammatory process. The query is put forth as to whether or not this is a neoplasm of the order known as *Sarcoma pleomorphic* (Fitz-Simons, Wilkins, Curry). The principal reason for this hypothesis is that the liver—the organ which suffers principally—is apparently surrounded by the fibrous network. This fibrous process never extends to a very great depth beneath the capsule, and does not follow the branching ramifications of Glisson's capsule. The liver parenchyma remains normal and the biliary passages are unobstructed. The vena

process seems to be one of mechanical strangulation. The prognosis is absolutely unfavorable as regards recovery. The duration of the disease may extend over ten or fifteen years, during which period the patient's general feeling of health varies as the ascites. The ascites may be attacked by the use of various diuretics. When the diuresis increases the ascites may be diminished, but probably mechanical evacuation at frequent intervals will give the best results. There are several cases on record that have been tapped over one hundred times.

As far as the writer knows, there have been no cases reported in the United States.

HOSPITAL REPORTS.

NEW HAVEN HOSPITAL, SEVENTY-SECOND ANNUAL REPORT.—The total number of patients under treatment during the year 1898 was 1,283, an increase of 129 over the previous year. This large increase in the number of patients is, however, referable to the soldiers treated, 170. The largest number of patients on any one day was 241, the smallest was 89, the daily average being 123. There 47 births and 146 deaths, the death rate being a fraction over 11 per cent. The average cost of supporting each patient was \$9.47, an increase of nearly 10 per cent. in the daily cost of food per patient. This is partly attributed to the presence of the soldier patients, who were dealt with generously during convalescence, but the Committee nevertheless feel the necessity of a revision in the dietary system, and recommend the abandonment of the present duplicate system of "house diet" and "light diet" for a single system. There were admitted during the year 1,170 patients—814 males and 356 females. Of this number 705 were discharged cured, 265 improved, 31 unimproved, 15 were not treated, 146 died, and the rest remained in the hospital. Of the 47 births, 21 were males and 26 females. The patients came from 90 different towns and villages in the state, and from 36 other states and countries; 686 were residents of the town of New Haven. Of the 148 occupations represented, the principal ones were as follows: Soldiers, 170; laborers, 74; housewives, 33; farmers, 23; seamen, 20; teamsters, 19; painters, 18; brakemen, 17; blacksmiths and machinists, 15 each; clerks, 11. The ordinary charge per week in the wards is \$7. The total current expenses were \$62,034.03; \$2,292 of this is rendered against the National Govern-

ment for care of soldiers. There was \$15,325.32 paid for salaries, the balance for living expenses, drugs, etc. During the year 92,678 quarts of milk and 336,715 pounds of ice were used. The medicines cost \$1,374.65. There were 605 medical and 565 surgical cases, and 267 operations. The Training School for Nurses during the year averaged 41.

THE NINETEENTH ANNUAL REPORT OF THE BRIDGEPORT HOSPITAL.—The total number of patients under treatment during the year, September, 1897, to September, 1898, was 819. The largest number on any one day was 91, the smallest was 49, the average being about 63 patients each day. There were 4 births and 87 deaths, the death rate being 10.6 per cent. The average cost of supporting each patient was \$8.68. There were admitted during the year 752 patients—440 males and 312 females. Of this number 430 were discharged cured, 178 improved, 47 unimproved, 87 died, and 77 remained under treatment. There 527 of the patients residents of Bridgeport, 17 from Derby, 16 each from Fairfield, Shelton and Westport, 13 from Stratford, 12 from Norwalk, and the rest scattering. The principal occupations were as follows: Housewives, 137; laborers, 106; no occupation, 64; shop hands, 58; children, 44; domestics, 41; farmers, 18; nurses, 16. The ordinary charge in the wards is \$7, which includes medical and surgical attendance, board, medicine and nursing. The current expenses were \$28,598.26; of this \$8,232.76 was for salaries, the balance for medicines, surgical apparatus, living expenses, etc. There were 294 medical, 465 surgical cases, and 299 operations. There were 103 gynecological cases, with 87 gynecological operations, and 465 eye and ear cases, with 72 operations. Eight deaths were due to phthisis, 6 each to pneumonia and cirrhosis of the liver, and 5 to appendicitis.

SUMMARY OF HOSPITAL REPORTS.

HOSPITALS.	Number of Patients.			Treatment.		Results.		Sundries.	
	Males.	Females.	Total.	Surgical.	Medical.	Cured.	Died.	Charge per week.	Expenditures.
New Haven.....	878	405	1,283	565	605	705	146	\$7.00	\$62,034.03
Hartford.....	1,097	686	1,783	840	943	1,157	170	6.00	71,925.98
Bridgeport.....	450	369	819	465	294	430	87	7.00	28,598.26
Waterbury.....	189	215	406	109	171	330	34	7.00	19,338.62
William W. Backus....	243	198	441	187	167	267	33	7.00	20,243.36

ITEMS OF INTEREST.

The "German Central Committee for the Erection of Sanitaria for Consumptives" has issued a call for a Congress to be held in Berlin, May 24 to 27, 1899, for the purpose of discussing the subject of tuberculosis. All the German States and all foreign countries represented at the Imperial court have been invited to attend and take part. Papers by distinguished German physicians will be read on the following subjects:

(1) "Distribution and Extent of Tuberculosis, (2) "Etiology," (3) "Prophylaxis," (4) "Therapy," (5) "Sanitaria." Following the papers there will be a general discussion. All persons interested in the subject of tuberculosis are eligible for membership. Membership cards (20 marks) are to be obtained at the office of the Congress (Bureau des Organisations—Komites, Wilhelm Platz 2. Berlin, W.) and entitle the holder to a copy of the proceedings. Any person who would prefer to receive a personal invitation to the Congress can do so by communicating with Ch. Wardell Stiles, Ph.D., Scientific Attaché, U. S. Embassy, Berlin, Germany, who will forward his name to the Executive Committee of the Congress. The request should be accompanied by a letter of introduction from a recognized medical, scientific, or veterinary faculty or society.

Dr. Petri, of the Imperial Health Office in Berlin, has found tubercle bacilli in 32 per cent. of 102 samples of butter recently examined.

The "Collier" bill to prevent the sale of antitoxine and other serums by the New York City Board of Health was defeated in the Assembly at Albany on March 30.

Prof. Hauseman, of Vienna, has examined the brain of the late Prof. Helmholtz and found it to weigh 1440 grams (about 45 oz.), and the convolutions were extraordinarily complex.

An automobile ambulance has been presented to a Chicago hospital. The vehicle weighs 1600 pounds and is capable of a speed of sixteen miles per hour. This is probably the first electric ambulance ever constructed.

The Chicago Bureau of Associated Charities has arranged to open a dental dispensary in each of its ten districts, the object being to furnish dental service to the poor at the smallest possible cost. Teeth will be extracted for ten cents. Filling will cost from fifteen to twenty-five cents. The dentists volunteer their services and the materials used are furnished at cost.

OBITUARY.

1848—Sigismond Waterman, M.D., died at his home in New York City, March 16, 1899. Dr. Waterman was born in Bruch, Germany, near Erlangen, February 22, 1819; coming to this country in 1840, he settled in New Haven, and two years later was appointed instructor in German in Yale College. While still instructor he began the study of medicine in the Yale Medical School, graduating in the class 1848. After graduation he resigned his position, removed to New York City, and began practice. In 1857 he was appointed Police Surgeon, which position he held for thirty years, being retired on a pension on account of advanced age. In 1868 Dr. Waterman introduced the study of spectroscopic analysis in the study of medicine and was himself an authority on this subject. He was one of the founders and, for a time, president of the Home for Aged and Infirm at Yonkers, and was a member of various social, charitable and medical societies.

1897—Dr. Albert Emory Loveland died of pneumonia at the McLean Hospital, Waverly, Mass., on April 8, after an illness of only four days. Dr. Loveland was born in Vernon, Ct., on November 30, 1869. He graduated from the Hillhouse High School in 1887, and after two years entered Wesleyan University, where he graduated in 1893. In his senior year he made some discoveries in connection with his biological work, which he published in the *Journal of Comparative Medicine and Veterinary Archives*, under the title: "On the Anatomy of *Tacina Crassicolis* Rud." This discovery attracted the attention of the Smithsonian Institute, and he was invited to Washington to explain his discoveries. He was assistant in the World's Fair Food Investigations in Chicago in 1893, under the National Board of Agriculture, and upon his return east, was appointed assistant to Prof. Cash in the Biological Department of Wesleyan University. In 1895 he entered the Yale Medical School. During his entire course he held the position of assistant in the Histology Laboratory, graduating in 1897, with the degree of M.D., *cum laude*, and receiving the Keese Prize for the most meritorious thesis submitted from his class. At about this same time he received the degree of M.A. from Wesleyan. After graduation he spent a year as resident physician at the Worcester (Mass.) Hospital. At the termination of his term of service he went to the McLean Hospital, a branch of the Massachusetts General Hospital, at Waverly, Mass., where he was engaged in the special study of nervous and mental diseases at the time of his death. He was a member of the East Pearl Street Methodist Church, being an officer in the Church and Sunday School. He was also a member of the Wesleyan Chapter of Delta Kappa Epsilon fraternity. Dr. Loveland was an earnest student of great promise, was universally respected as a man of character, and his loss will be sincerely regretted by all who knew him.

ALUMNI AND SCHOOL NOTES.

'91—Dr. F. O. Chamberlin, formerly of Paris, has moved to 1010 Sutter street, San Francisco, Cal.

'91—Dr. H. A. Elcock has moved to Branford, Conn., and opened an office there.

'93—Dr. E. R. Peck will move his office, on May 1, from 312 Elm street, New Haven, to the corner of Chapel and Howe streets.

'94—Dr. E. S. Moulton, who is now in Ecquador, South America, will return to New Haven in July.

'94—Dr. E. L. Kingman expects to sail for Ecquador, South America, during the early part of May.

'96—Dr. S. H. Wadhams, Acting Assistant Surgeon U. S. A., and Inspector of Vaccination at Ponce, Porto Rico, expects to return on a furlough soon.

'97—Dr. John E. Herrity has been appointed to a position on the staff of the New York Lying-in Hospital, at Second avenue and Seventeenth street.

'97—Dr. Earle Terry Smith was married on April 18 to Miss Georgiana Munger, of New Haven, daughter of late Judge Munger, of Rochester, Yale, '47. They sailed for Germany on the same day. Dr. Smith intends to pursue special work at different universities there.

'97—Dr. George H. Warner has opened an office in Boulder, Colorado. Address P. O. Box 342.

'97—Dr. J. A. Lee has started the practice of medicine at Kingston avenue and Herkimer street, Brooklyn, N. Y.

'97—Dr. F. H. Todd has passed the New York State Examinations, and has opened an office in Paterson, N. J.

1900—H. A. Tarbell is at present in Bloomingburg, N. Y., recuperating from his recent illness.

1900—Pitts, Vincent and Buist recently completed the regular two weeks' course at the New York Lying-in Hospital.

'01—F. H. Schofield has been compelled to leave school on account of ill health.

The following Alumni have died during the past year: Woodbridge Bodwell, '36, who was the last surviving member of his class; Horace Burr, '42; Sigismond Waterman, '48; Orlando Brown, '51; Myron N. Chamberlain; A. E. Loveland, '97.

BOOK REVIEWS.

Pathological Technique—A Practical Manual for the Pathological Laboratory. by Frank Burr Mallory, A.M., M.D., Assistant Professor of Pathology, Harvard University Medical School, etc., and James Homer Wright, A.M., M.D., Director of the Laboratory of the Massachusetts General Hospital, etc. 397 pages, with 205 illustrations. Philadelphia, W. B. Saunders, 1937. \$2.50.

Any satisfactory work on technique must combine completeness, conciseness and exactness. The authors of this book have combined these three essentials so unusually well that we take pleasure in briefly reviewing and commending their results, though at this rather late date. The title indicates exactly the field covered. It is divided into three main parts. First *Mortem Examinations, Bacteriological Examinations, and Histological Methods*. The first part covers a little over fifty pages. A description of the necessary instruments for making autopsies, with cuts of the same, is given. Then follows directions for making a methodical examination of the body as a whole, as well as the individual organs. The numerous practical suggestions here will be found of decided value, especially for beginners. The second part, *Bacteriological Examinations*, extends from page 71 to page 203. The necessary pieces of apparatus for this are described. The few culture media which are really of value and the accepted methods of preparing these are given, together with the various cultural methods and the manner of animal inoculations. The old obsolete methods, which are only of historical interest, are conspicuous by their entire absence. Nearly half of this second part is devoted to bacteriological diagnosis. Here the individual pathogenic bacteria are described, including their cultural and staining peculiarities, pathogenesis and occurrence in the body. To one interested chiefly in the clinical aspect of the subject, the last twenty-five pages of this second part, devoted to *Clinical Bacteriology*, is of particular interest. The completeness and exactness of methods of technique here is very evident. As an example, instead of giving a single method of examination for the tubercle bacilli, the examination of sputum, of urine, and of surgical material is separately treated, emphasizing the care necessary to differentiate the tubercle and tubercle bacilli in the urine and the very small numbers of the tubercle bacilli frequently present in tuberculous material removed at operations. The third part of the work, *Histological Methods*, though perhaps the most important of all, can be but briefly noted. It is only after using the book for some time in the laboratory that one appreciates the completeness of description of histological methods. Directions for the examination of fresh material, for fixing and sectioning in various ways and for various purposes, for mounting and staining, for the preparation and use of the different stains, for testing for special pathological products, etc., are given. A short but valuable chapter on *Clinical Pathology* closes the third part. As a whole, the work is found not only for use in the pathological laboratory but for all practitioners and students alike who care to make careful examinations of any pathological products.

BOOK NOTICES.

The Anatomy of the Central Nervous System of Man and of Vertebrates in General. By Prof. Ludwig Edinger, M.D., Frankfort-on-the-Main. Translated from the Fifth German Edition by Winfield S. Hall, Ph.D., M.D., Professor of Physiology in the Northwestern Medical School, Chicago, Assisted by Philo Leon Holland, M.D., Instructor in Clinical Neurology in the Northwestern University Medical School, Chicago, and Edward P. Carleton, B.S., Demonstrator of Histologic Neurology in the Northwestern University Medical School, Chicago. Illustrated with 258 engravings. 6½ x 9½ inches. Pages xi-446. Extra cloth, \$3.00. The F. A. Davis Co., publishers, 1914-16 Cherry street, Philadelphia.

Sexual Impotence. Its pathology and treatment. By Victor G. Vecki, M.D. A second edition, revised and re-written. Price, \$2.00 net. Published by W. B. Saunders, Philadelphia, Pa.

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MALIGNANT DISEASE OF THE UTERUS, ITS DIAGNOSIS AND TREATMENT.

BY FREDERICK HOLME WIGGIN, M.D.,

Surgeon to St. Elizabeth's Hospital, Gynæcologist to the New York City Hospital, President of the New York County Medical Association, and formerly Third Vice President of the American Medical Association, etc.

Shortly before his death, the late D. Hayes Agnew is reported to have said that, were he to begin life over again, he would devote it to the study of cancer. The startling increase in the number of patients suffering from malignant disease warrants the statement made by a recent writer, that if the present rate of progression continues, in the next decade the disease under consideration will be the peer in mortality statistics of tuberculosis.

At the present time 7 per cent. of all deaths occurring in women over 45 years of age are caused by cancerous disease, and of these a very large proportion commence either in the neck or body of the uterus. Even at the present time the disease frequently runs its course unrecognized during the patient's life. These facts and a few others will suffice to show that there is no subject of greater interest to the general practitioner and gynæcologist at the present time than that of Malignant Disease of the Uterus and its early diagnosis, for on this depends our patient's chance of permanent relief from her dreadful malady.

The results which have hitherto been achieved by the gynæcic surgeon in the radical operations performed for the relief of sufferers from the disease which we are considering, while often

followed by a low rate of mortality, have not been brilliant, when the recurrence of the disease is taken into consideration, for, according to Thorne, hardly 30 per cent. of patients upon whom vaginal hysterectomy has been performed for malignant disease of the uterus, and who have survived the operation, remained well at the end of five years. This poor and discouraging result he attributes (and the writer believes justly) to the fact that 70 per cent. of patients suffering from this disease, who present themselves to the surgeon for examination and treatment, do so in the latter stages of the disorder, instead of in the earlier, as they should. The responsibility for this failure to recognize the disease during the earlier months of its invasion rests largely upon the general practitioner into whose hands these patients usually come first, and who seems to be largely imbued with the popular idea that all sorts of menstrual irregularities may occur during the last years of a woman's child-bearing period of life, without being of serious import, unless accompanied by a story of pain, foul vaginal discharge and evident cachexia; forgetting that, as Baldwin has recently pointed out, these last are the "symptoms, not of incipient, but of inoperable disease."

Williams, in a recent article on cancer, says that at the present time there are probably eight thousand women in England and Wales who are suffering from malignant uterine disease; while in the State of New York alone, during the year 1898, there were reported to the State Board of Health 4,456 deaths as having occurred from cancerous diseases, a large proportion of which were undoubtedly those of the womb.

These statements of the common occurrence of the disease, coupled with the fact, which is borne out by the writer's experience both in hospital and private practice, that only a very small proportion of cases reach the surgeon at a time really favorable for operation, viz: before the disease has extended beyond the organ where it originated, must be his excuse for calling your attention to a brief review of what is already well known of this dreadful disorder, in the hope that further discussion of the subject may, by bringing out individual views and experiences, throw more light than we have hitherto had on malignant uterine disease in its earlier stages.

As is well known, cancer is a disease which originates in the epithelial structures. At the present time, though doubt still exists as to its etiology, the recent work of Sanfelice, Roncali, Bra, Bose, Gussenbauer and others, make it seem most probable that the time is at hand when the micro-organic origin of can-

cer will be fully demonstrated and accepted as a fact. Among the chief indirect causes of the disease may be enumerated heredity, locality, age, trauma, and infection caused by and following child-bearing. A fair proportion of all who suffer from malignant uterine disease, as do those suffering from other forms of the malady, give a family history of cancer, showing that heredity plays a part by producing a predisposition to the disease. Location of residence is a factor of importance, as there are districts in which the disease is unusually prevalent, notably as stated by Park, in Bath, England, whose health officer recently reported that in his district there were 50 per cent. more cases than in neighboring ones; Lockau, in Germany, where seventy-three deaths from cancer occurred in twenty-three years, within an area comprised by two or three city squares, four deaths occurring in one house. The same writer also calls attention to the unusual prevalence of the disease in the districts immediately surrounding Buffalo, N. Y. Age is an important factor in the development of the disorder, for while it may occur at or during almost any period of life, it is most likely to make its appearance between the thirtieth and fiftieth year, and more commonly during the latter half of this period.

Women who have borne large numbers of children are more subject to it than are nullipara. This fact is clearly shown in a study made by Mullins and published in the *Australian Gazette* for January, 1897, of 585 cases of females who had died in New South Wales of cancerous disease, 202 of whom had uterine cancer; of these 17 were sterile and two were single females, while the remaining 183 had been married and had given birth on an average to five children each. The other factors which enter prominently into the causation of the disease are cervical lacerations and neglected endometritis. The cervix is much more frequently attacked by the disease than is the body of the uterus, some observers placing the ratio as high as 50 to 1; but the writer believes that the uterine body is more often the seat of the disease than is supposed to be the case. Malignant disease when located in the lower segment of the uterus, makes its appearance more frequently before the occurrence of the menopause than after it, and is most likely to occur in those who have borne many children, and who, as previously stated, belong to the lower classes of society; while the disease in its corporeal form generally begins after the occurrence of the menopause, and in those women who have not conceived. The most common form of the disorder is adenocarcinoma, but occa-

sionally it is of the sarcomatous variety, when it runs its course with great rapidity. Unfortunately the disease is frequently ushered in with few or no symptoms to attract the attention of the patient, or of her physician, to the fact that she is suffering from a serious disorder.

But as a rule, the disease manifests itself by the following constitutional symptoms. A general feeling of discomfort, loss of energy, anorexia, and an ill-defined sense of fulness and uneasy sensations referred to the lumbar, sacral and genital regions accompanied with more or less marked increase of vaginal secretion or leucorrhoea. If this discharge is examined, it will be found to be less viscid and more watery than it usually is. If the patient is a woman between 30 and 45 years of age and has borne several children, a digital examination of the cervix will reveal the fact that it is enlarged and indurated and possibly slightly nodular. If we inspect it by means of a speculum we will find that on one or other side of a deeply lacerated cervix there is either a little hard nodule or an elevated area of mucous membrane, redder in color than normal and tending to bleed freely when touched. The disease at this early stage of its existence simulates very closely simple erosion of the cervix, but it is well to bear in mind that an eroded surface is smooth and velvety to the touch, has not infiltrated edges, and that on its surface the curette makes little impression. Any condition of this sort, however, that does not yield readily to ordinary treatment and tends to spread, should be regarded with more than suspicion, and the diseased tissue at once removed. It can then be examined microscopically and the exact nature of the disease can then be determined.

Some years since, the writer had a doubtful case under observation, one in which the disease was confined to the cervix, but not wishing to subject the patient to an unnecessary operation, a portion of the diseased tissue was removed and sent to a pathologist for diagnostic purposes. In about ten days an answer was received that the disease was malignant in its nature, and preparations were made to proceed with the removal of the uterus; when it was found that during the interval which had elapsed the disease had made rapid progress, the case being no longer a favorable one for operation, the body of the uterus and the vaginal wall having become involved in the destructive process. Hence it has been the writer's custom of recent years to first remove all tissue of a doubtful character and have it examined afterwards.

The early stage of cervical cancer, it should be remembered, is rather favorable to the occurrence of pregnancy, and also that when this condition co-exists, the malignant disease makes rapid headway. At a later stage of the cancer of the cervix, we will find on inspection, either a series of warty growths which are friable and bleed easily, or that a deep ulcer with raised friable edges exists. At this stage, microscopical examination of the diseased tissue is not needed to settle the diagnosis, and the patient now begins to complain of hæmorrhage following coitus, of metrostaxis, menorrhagia, metrorrhagia, and escape from the vagina of foul smelling watery discharges, more or less tinged with blood, accompanied by pain. The sooner, under these conditions, the uterus is extirpated, the better will the patient's chances, not only for immediate recovery from the operation, but for freedom from recurrence of the disease for at least three years, which as has been said, is the true test of the success of the operation,

When a patient who is between 45 and 50 years of age, or older, and who has never conceived, calls our attention to the fact that a few months after the cessation of her menstrual flow she has begun to fail in health, has also developed a profuse watery leucorrhœal discharge, and that her flow has recurred, a bi-manual examination of the uterus should be made, and will probably reveal the following conditions, viz.: That the body of the uterus is enlarged and tender, and possibly nodular, and that the external and internal ora are both patulous. Such a patient should without delay be placed under the influence of an anæsthetic agent and the cervical canal dilated and the uterine cavity explored.

If the trouble is found not to be due to fibromata, the uterus should be removed and the histological examination of the tissues made after this has been done, rather than before, as is usually the case. The curettage and delay incidental to this procedure before operation favoring the rapid progression of the disease, if it is of a malignant character.

Neuman believes that when chronic and severe metrorrhagia occur in a woman who has passed the menopause, who is failing in health, and becoming anæmic, a diagnosis of carcinoma of the corpus uteri can be made almost with certainty, provided there be not carcanoma of the cervix.

It has been well said that the best treatment that a woman suffering from a carcinoma of the uterus can receive at the hands of her family physician, is the early recognition of her condition, when the removal of the diseased organ should fol-

low, and a cure be effected. The value of this early diagnosis is well brought out by Haggard, who reported in the *Southern Practitioner*, vol. 19, p. 175, 1897, seven cases in which cancer had existed six months or more, who were operated upon, two years later none were alive; while in seven other cases operated upon in which the disease had existed for less than six months, six were still living two years later.

Attention has already been called to the fact that by far the largest proportion of cases that reach the surgeon, do so after the disease has progressed too far to give a reasonable hope that the patient will be benefited by a radical operation. These patients can, however, still have much done to relieve their distressing condition, by placing them under the influence of an anæsthetic agent and removing as much as possible of the diseased tissue. After this has been done, the hæmorrhage which is often free can be controlled by packing the cavity with pledgets of cotton, wet in a 5 per cent. solution of antipyrine, or, better still, with hydrozone, the pledgets being removed after a little while, and if the hæmorrhage continues the cavity should again be packed with similiar pledgets, and it is rare that this procedure has to be followed more than three times. If the flow of blood continues after the third packing has been removed, the cavity is once more to be packed, and the pledgets allowed to remain in place twenty-four hours. The hæmorrhage having been controlled, the packing is removed and the parts are thoroughly irrigated. The vagina and vulva should next be well anointed with a salve composed of one part of bicarbonate of sodium and three parts of vaseline. The uterine cavity is then packed with small pieces of cotton rung out in a solution of chloride of zinc, which should vary in strength from 50 per cent. to 100 per cent. according to the thickness of the remaining uterine tissue. Any excess of this solution must be rapidly removed with sponges and the vagina should be filled with cotton soaked in a saturated solution of bicarbonate of sodium. Forty-eight hours later all this packing is to be removed, and the parts again irrigated. This treatment, which has been described by Penrose, has been followed for the past two or three years by the writer, both in hospital and private practice, with much benefit to his patients. The hæmorrhage is controlled, the offensive discharge disappears for a considerable time, and the patient, being relieved in a large measure of her sepsis, improves in appearance and gains rapidly in weight. Lucas Championerre advises the use in these cases of carbide of calcium, and gives

the following technique for its application. The vagina is first irrigated and then a small piece of the carbide is to be placed against the ulcerated surface. Bubbles soon appear, showing that acetylene gas is being generated. The vagina is now to be carefully packed with iodoform gauze. This is done to prevent the irritant effects of the products of decomposition of the carbide of calcium on the mucosa of the vagina and vulva. The packing should be allowed to remain in place for three or four days and then is to be removed. The parts should then be irrigated and all crusts removed. This procedure can be repeated at intervals of from two to six weeks as needs be. The claims made for it are that it stops hæmorrhage, thoroughly suppresses odor, and relieves pain in a large proportion of the cases so treated.

In conclusion let me call your attention again to the fact that pain in these cases is an unreliable symptom, only occurring late in the disease except in certain cases, where the patient complains that she suffers from attacks of agonizing cramp-like pains which recur during the latter part of each afternoon. Such a symptom when present in an elderly woman, is almost pathognomonic of cancer of the uterine body and is due to pent up secretions in that organ. Hæmorrhage is a constant symptom, but of the latter stages of the disease, as is also the foul smelling vaginal discharge. Don't wait for a patient to tell you of this concatenation of symptoms, before you think of a possibility of malignant uterine disease. Bovee says: "The disease is so dreadful and so rapid, that the family physician should always have in mind the possibility of it, in the wives and mothers, in his clientele." The acceptance as an axiom of the statement that an increased flow of blood occurring before at or after the menopause is always due to an abnormality and needs careful investigation as to its cause, would undoubtedly save innumerable lives. Let me call your attention to the fact that no form of malignant disease is so amenable to operative treatment, or promises more brilliant results, than does that of malignant uterine disease, provided only that the disorder is recognized, and the operation is performed while the morbid process is confined wholly to that organ, or in other words, during the earlier stages of the disease or before its advent, and I would also have you bear in mind the fact that even when the disease is not recognized till it has passed the stage favorable for an effort to bring about a cure of the patient by extirpation of the diseased organ, that much can still be done in the way of palliative treatment, which

will not only render the remainder of the patient's life more bearable to herself and her friends, but will actually prolong it.

Our patients should be taught to return to us for examination within three months after confinement, and when uterine abnormalities are found they should be eradicated by operative means without delay. Patients should be further taught that the period of life between 40 and 50, which usually includes the menopause, is one of danger, and that during this period they should be more or less under the supervision of their physician. On our part we should be more careful to examine locally all those who have reached this period of life, who complain of failing health, increased leucorrhoeal discharge and the slightest menstrual irregularities, tending to an increased loss of blood. In cases of doubt, our patients should be given the benefit of it, by submitting them at once to operation, while there is yet time and hope that the disease may be permanently removed.

And finally, while we have good ground for believing that at a day near at hand, the micro-organic origin of cancer and its infectious nature will be fully established, and that once the life history of the germ is known, we shall be able largely to prevent the occurrence of the disease. We must for the present base our hope of permanently benefiting a greater number of our patients suffering from this fearful trouble, not upon improved operative technique, but upon an earlier recognition of the existence of the malady.

THE PROGRESS OF MEDICINE.*

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In responding to the question of the progress of medicine one is met at the start with so many thoughts as to cause psychological vertigo much as had Van Helmont in his dream of entering the cave of medical knowledge. After acquiring one's equilibrium and seeing the labyrinth of medical progression one is in doubt which path to take. With your tolerance I will name a few of these paths that seem to me the most important.

Need I mention the careful decision required for the diagnosis and care of cardiac murmurs, and in some cases the absolute avoidance of, or if needed the scientific manipulation of, cardiac drugs. It is also hardly necessary for me to urge the estimation, perhaps roughly, of the urea output to prognosticate the future of, or to intelligently treat, a chronic nephritis, albumin or casts, absent or present, being unreliable for this purpose. It is almost catechismal to mention the Widal reaction, if correctly carried out, giving the diagnosis of typhoid fever in a day, making it almost inexcusable to cinchonise a supposed malaria for a week. In passing, I wish to recommend the tincture of the chloride of iron, given regularly every six hours, for typhoid fever, as I believe that it adds to the toxic fighting power of the blood, and certainly clinically reduces the temperature, and mollifies all of the symptoms.

We are now making blood-examinations not only for diagnostic purposes, as for the malarial plasmodia, or for determining the kind and character of an anæmia, but also for the prognostic value of the presence or absence of a temporary leucocytosis, i. e., a short-lived increase in the number of white blood-corpuscles. If this leucocytosis is present in a doubtful case of appendicitis we are warranted in diagnosing pus, while the white blood-corpuscles are always increased in septic conditions and in pneumonia. In fact when in pneumonia they are not

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increased the prognosis is bad. These leucocytes undoubtedly come in increased numbers as nature's way of fighting streptococci and staphylococci infections. Leucocytosis does not occur in typhoid or malarial fevers unless some causative complication is present.

A word about bowel infection, a condition which we have often treated with quinine because of irregular chills, and we have even called it a one or two week typhoid, or a "bilious fever." Now, by our means of exclusive diagnosis we discover a separate entity in the shape of irregular chills, often high fever which runs a remittent course, the urine concentrated, depositing urates and phosphates, and giving a strong indican reaction. The tongue is heavily coated, there is often nausea, constipation generally, sometimes tympanites, a yellowish cast to the skin, and the curative treatment is calomel one or twice, and the best bowel antiseptic, namely, salol or salicylic acid in some form. Let me here urge the more frequent examination of urine for indican, as it always denotes the amount of fermentation and putrefaction in the intestine.

We are in the age of scientific chemistry, and with this I include all examinations of bacteria, and what is more important their products and antitoxins. I shall spend no time upon the wonderful medical progress in this line, as my colleague will talk about this subject of such vital importance to us. But in passing we should note the continued experimentation with an antitubercular serum prepared by immunizing horses with "tuberculin rest" the "T. R." of Koch. Also it is well to remember that the hectic fever of tuberculosis is due to the streptococci and is a streptococcus fever, and is not due to the tubercle bacilli. Hence we only have this fever when there is suppuration, and in the lungs, at least, creosote or a creosote-bearing preparation is the best treatment.

An increased uric acid output seen in febrile conditions, and in some wasting diseases, is due to a breaking down of cells rich in nuclein, and is not due to disturbed urea digestion going to uric acid formation, which old theory has been disproved. This is a strong argument for the administration of some nuclein-bearing substance to offset this metabolic loss.

For several years I have considered myself a heretic in decrying the absolute withdrawal of carbohydrates from the diet after the dietetic treatment had proved the case to be true diabetes mellitus, and not a simple dietetic glycosuria. And now investigators tell us that by withdrawing carbohydrates absolutely from diabetic cases we increase the danger

from acetonuria, and they advise the giving of carbohydrates freely whenever acetone is present in considerable amount. I wish to go on record as stating that I believe it to be unjustifiable to persist in a pure proteid diet for a true diabetic case.

We now come to one of the greatest revolutionizers of medication that the world has known, and this also has been reached through physiological chemistry. I refer, of course, to the glandular extracts. A few years ago the internal secretions of various organs of the body, and more especially of the ductless glands, were not sufficiently understood by physiologists to be of moment to the clinician. Now, however, the therapist has become so much interested in the organic extracts prepared from these glands, and with study of serum therapy, that in a short paper only a small portion of the subject can be covered.

Perhaps the study of myxoedema first caused physiologists to turn their attention to the thyroid gland which was always found atrophied in this disease, and in 1883, Kocher and Reverdin first observed the symptoms due to the removal of thyroid glands from animals. The increased knowledge of internal secretions, and of cell-products, and their various physiological actions has now made such an impression upon the medical public as to cause John Aulde, of Philadelphia, in February of 1898, to remark, that, "When we consider the multiplicity and delicacy of the cellular structures of the human body, the interdependencies and complicated relationships of the different organs, together with the profound changes which may result from psychological deflections, the temerity of the American public in practicing self-medication must be regarded as the most astonishing spectacle of the nineteenth century."

Our interest lies in the glands of the body which are ductless, but furnish some elaborate product which is necessary to the human economy. I might say that the most interest has been centered in the life-giving product, nuclein, which was, perhaps, first brought to our notice in 1894, by Prof. V. C. Vaughan, of the University of Michigan. He proved that this product which he elaborated had a germicidal action on many bacteria, while various other experimenters claimed that this nuclein furnishes life-giving power to all animal cells. This nuclein can be obtained from the spleen, thyroid gland, testicles and other animal tissues, but Vaughan claims, perhaps, most conveniently extracted from pure cultures of yeast, by a dilute solution of potassium hydrate.

Now just what is nuclein? Professor Chittenden says the original term nuclein was applied to peculiar phosphorized sub-

stances isolated from the nuclei of pus-cells, and which apparently made up the greater portion of the nucleus. It was soon discovered that this, or like substances, was widely distributed through nature in both animal and vegetable kingdoms wherever nucleated cells occurred. Kossel discovered that these nucleins largely contained phosphorus, and from his discoveries we separate two distinct groups, those which with dilute sulphuric acid yield nuclein bases, true nucleins, and those which do not yield such crystalline decomposition products, false nucleins or para-nucleins. A nuclein, then, is, according to Professor Chittenden, simply a combination of some form of proteid with nucleic acid. Nucleic acid is an amorphous white powder of strong acid reaction readily soluble in water containing a small amount of alkali, and insoluble in alcohol and ether. Nucleic acid contains a large per cent. of phosphorus, as much as nine per cent. of this element having been found in some forms of this acid.

Promoters of the nuclein treatment of disease state that it is especially indicated where there are pathological bacteria or their products to be combated in the system. They claim, and they undoubtedly do promote leucocytosis, and we know that the white blood-corpuscles are largely protectors of the organism against bacteria. They would then recommend this treatment in such conditions as diphtheria, typhoid fever, scarlet fever, septicæmia, and perhaps in conditions of denutrition, but not carrying in the latter case the treatment too far lest we get a hyperleucocytosis. I have noted in the use of these preparations an increased tendency to hemorrhage, nose-bleed and profuse menstruation. Whether these nucleins and proto-nucleins as such have a stimulating vitalizing power on the system I am not prepared to state. That we cannot overlook the value of those bearing phosphorus as giving phosphorus to the system in the animal form is certainly positive.

Along this same line of therapy comes the use of red bone-marrow. It is claimed, and I think true, at least its use in anæmia bears out the assertion, that red bone-marrow stimulates the formative processes, and increases the rate of production of the red blood-corpuscles. The indication for red-bone marrow would be any condition of anæmia, simple or due to organic disease, amenorrhœa, rickets and bone diseases generally, and even neuralgias where there is lack of nutrition.

Turning now to the products of special ductless glands, we find the subject to be much more of interest because our knowledge is more certain. Brown-Sequard first attracted the

world's attention to his wonderful "elixir of life," namely, injections hypodermatically of testicular fluid, but his discovery caused many deaths from septicæmia, as the method of preparing the substance and its preservation was so crude. Enough to say of this product that we have probably much to learn concerning it, and that orchitic substance has been recommended in such conditions as melancholia and hypochondriasis, as well as in senility.

Our greatest interest in glandular extracts turns to that of the thyroid, as this has been the most carefully studied, and to understand the action and uses of this gland perhaps it would be best for a moment to study the symptomatology of the disease called myxœdema. Dercum gives the definition of this disease as "A constitutional disease depending upon atrophy of the thyroid gland and characterized by a myxœdematous condition of the subdermal tissues and progressive mental failure." In a word, then, the symptoms of this disease are referable to the skin, mental functions and thyroid gland.

Operations for curing goitre by removal of the thyroid gland showed that if the whole of the gland was removed a condition simulating the disease of myxœdema supervened, to which the name of operative myxœdema has been given, and we know that the thyroid gland is atrophied and its glandular tissue is replaced by connective tissue growth in myxœdema. We do not know positively just what this loss of glandular action of the thyroid removes from the organism. According to Horsley the thyroid is a blood-forming organ, and he also says that the gland regulates the formation of mucin. Schiff states that the thyroid secretes a substance which influences the nutrition of the nervous system.

As to the chemistry of the thyroid, or its secretion, there seems to be principally a phosphoric acid output. Hence, after the removal of the thyroid, or its atrophy, the loss of the secretion of this acid causes the retarded bone-development and slow calcification as seen in cretinism.

We find that not only is the metabolism decidedly disturbed by the removal of the thyroid, but if we feed the thyroid glands to animals, or man, we increase the nitrogenous output, and Leichtensteirn and Wendelstadt were among the first to notice that the feeding of thyroid glands to obese individuals caused a loss of body weight, and that there was an actual increase of nitrogenous waste. Also an increase of sodium chloride and phosphoric acid has been found in the urine after the feeding of thyroids. In 1895, Baumann made a most inter-

esting discovery from a chemico-physiological standpoint, namely, iodine in the thyroid gland, which, though in small amount, is always found in the active gland, as confirmed by many analyses. This discovery introduces an entirely new idea into physiology, namely, that an element considered foreign to the body has been found normally contained in it in an animal combination. Traces of iodine have also been found in the spleen, supra-renals and ovaries, but the amount has been so very small, as compared with that found in the thyroid, as to compel the decision that the discoveries must be accidental. Schnitzler has found iodine in the pituitary body. Professor Mendel, of the Scientific School, after careful examination of the thymus glands of calves, found no iodine in them, though the thymus gland seems closely related in region and function to the thyroid. The activity of the thyroid seems not to be decided by the amount of the iodine found, but by the amount of the colloid material, so that the colloid substance seems to represent the activity of the thyroid gland. (Mendel.) The largest amount of iodine is found in this gland between the ages of twenty-five and fifty-five. The location also seems to make a difference in the iodine content of the thyroid, there being more iodine found in the thyroids of people living near the seashore.

Acromegaly is another disease in which we find the thyroid gland generally, if not always, functionally diseased.

Our indications for the use of thyroid extract, or some preparation of the thyroid gland would certainly be theoretically, and has been proved in many cases practically, the proper treatment for those conditions in which the thyroid secretion is diminished. Möbius contrasts exophthalmic goitre, or Grave's disease, with myxœdema, the former being due to excitation, and the latter to an arrest of the functions of the thyroid.

The diseases, then, in which we would use the thyroid extract are: Myxœdema, cretinism, exophthalmic goitre, where the gland had become degenerated, or cystic, instead of furnishing the hyper-secretion, which is certainly true of the first stages of this disease. Of course, thyroid extract should be used in those rare cases where the thyroid gland has been removed. Also by the very property which we have already discussed, namely, that thyroid feeding produces an increased nitrogenous waste, and in some unaccountable way a reduction of the fat of the body, thyroid extract is probably one of the best treatments for obesity. It is interesting to note that the effects of over feeding thyroids, or an over feeding of thyroid ex-

tract, are similar to those seen in the first stages of exophthalmic goitre, namely, palpitation of the heart, irregular action of it, dizziness, tendency to syncope, and general weakness and debility. Several cases of death have been reported from the over use of thyroid extract. The thyroid preparations also have an accumulative action, and this is, of course, especially noticeable where it is used in obese cases, namely, where the thyroid gland is probably doing its normal work, and we thus put into the system a greatly increased amount of thyroid secretion. Thus, in giving it to an obese patient we may not find any reduction of the weight for several weeks, and, on the other hand, after we cease to give the thyroid extract, reduction of weight may continue for some time. The same is true of the debility which long use of these preparations causes.

As the first symptoms of thyroid feeding seem to be some cerebral stimulation, or exhilaration, it has been recommended in melancholia, and even in some other forms of insanity. I cannot but feel that as the second stage of thyroid medication is that of debility that it could hardly be indicated in cerebral depression.

In exophthalmic goitre as such the thyroid extract is useless, and even harmful, unless the thyroid gland becomes so cystic as to practically furnish none of its normal secretion. In this disease suprarenal extract will probably be found of much value.

The next internal secretion with which we are most familiar, and which has been the most carefully studied and analyzed, is that of the suprarenal capsules. Professor Abel, of Johns Hopkins, has perhaps furnished the most careful work on this gland. The greatest interest in the secretion of the suprarenal lies in its power of contracting the blood-vessels, and raising the blood-pressure. Dr. W. H. Bates, of New York, was one of the first to draw attention to the powerful astringent and hæmostatic properties of the aqueous extract of the powder of the dessicated suprarenal when it is instilled into the eye, the conjunctiva, palpebral and ocular being whitened in a few minutes. Not even cocaine can produce such an astringent effect and this action is seen with solutions of even less than one per cent.

This local action of suprarenal extract makes it very valuable in many eye inflammations, and operations. This same power of contracting blood-vessels is seen on applying an aqueous solution to the mucous membrane of the nose and throat, and hence such applications become of value in hay fever, and in all acute congestions of the nasal passages, tonsils and pharynx. Injection of this solution can but do good in the congestive stage of acute urethritis.

Abel has isolated the active principle of the suprarenal, as a light gray or brownish powder to which he gives the name of "epinephrin." When he furnishes us with a soluble salt of this substance for hypodermic use we will be more than grateful to him. We can by stomach administration slowly raise the blood-pressure, but with a hypodermic needle we could probably save the life of many a patient dying of shock or of vaso-motor paralysis.

The exact glandular value of preparations of the suprarenal cannot not now be stated, as the subject is yet in its infancy. Theoretically we should expect it to be of use in Addison's disease, a disease in which the suprarenal capsules are affected, and Abel says we shall know more about this disease from experimentation with epinephrin. It has also been suggested that it be used in certain cases of anæmia, and perhaps in certain conditions of heart weakness, as in some respects its action is similar to digitalis. Be that as it may, as to its internal uses, the effect of the drug locally on mucous membranes is positive, and its efficiency will soon be more generally recognized. Thus far no permanent aqueous solution has been made, but ten grains of the dessicated suprarenal to a fluid drachm of warm water seems to be the proper strength for local use, although half of this strength is perhaps often sufficiently active.

The extract of the thymus gland is being experimented with, and as I before stated, has been found to contain no iodine. Its use can, perhaps, be thought of in such conditions as lack of bone-development, especially in children, as in rickets, and perhaps in tuberculosis. Preparations from the spleen might be considered in such conditions as chronic diarrhoea, and in diabetes where the spleen was the cause.

Cyon, of Paris, in speaking of what is known of the functions of the pituitary body, says that "this body is prone to be affected by variations of pressure, whether of the cerebrospinal fluid or the blood, and that irritations of this body induce alterations of blood-pressure, slowing of the heart-beat, and an increase in the force of the cardiac contractions." He says that injection of an extract of pituitary body into the veins of animals produces the same results as are produced by electric or mechanical stimulation of the organ.

The only constant condition in which we know the pituitary body to be degenerated is acromegaly, which is a disease primarily of increased bone growth. In this condition we are now studying the use of the pituitary extract.

The value of ovarian extract is still subject to question, although it has been used with apparent good results in many

disorders of the female organism, but so many of these conditions are surrounded by hysterical manifestations and psychic phenomena, that we cannot always separate the actual results of a treatment from those caused by the impression made on the mind.

As to the value of orchitic extract or fluid, whether or not we can positively get good results as a general rejuvenator, or in mental debility, or in actual impotence, is still a subject for future research.

The testicular extract is prepared from the testes of the bull, and the dose of a D'Arsonval liquid preparation ranges from 1 C.C. to 4 C.C. injected subcutaneously. One of the active principles has been called spermine. It is a phosphate combination, but undoubtedly does not comprise the whole value of the extract.

INSANITY IN ITS MEDICO-LEGAL RELATIONS.*

BY GUSTAVUS ELIOT, A.M., M.D., NEW HAVEN, CONN.

A physician practicing in Connecticut may be required to express his opinion, in a court of law, in regard to the mental status of an individual, under different circumstances. Most frequently he is called upon to appear in the court of probate, after having examined a person alleged to be insane, and to testify whether in his opinion the person is insane, and should be confined. Less frequently he is summoned to testify in one of the criminal courts in regard to the mental condition of an individual, who has committed some crime, but who, if found by the court to be insane, will for that reason escape incarceration in jail or State prison. Rather infrequently he is asked to express his opinion in the civil courts in regard to the mental capacity of an individual to make a will or to execute other legal papers.

The Legislature of 1895 passed "An Act Concerning Insane Persons," which went into effect on the first day of August of that year. By this act the commitment of insane persons to asylums is vested in the court of probate. This court exercises jurisdiction upon written complaint, which may be made by anyone, that a person "is insane and is a fit subject to be confined in an asylum." At the time and place assigned for hearing the complaint, "the court shall require the sworn certificates of at least two reputable physicians * * * that in their opinion such person is insane and a fit subject for confinement in an asylum."

There are one hundred and twelve probate districts in the State of Connecticut, and an equal number of judges of probate, who by this act have authority to hear complaints, and to commit insane persons to asylums. Most of these judges are lawyers, but a few are not. One at least is a physician, a former member of this society. It is not strange that so many different men should carry out the law in somewhat different ways. In most cases, however, it seems to have fulfilled admirably the purposes which it was designed to accomplish, of furnishing a uniform system of promptly committing the insane to asylums, of doing

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it with proper regard to the rights of the individual, and of avoiding committing anyone who is not actually insane. Public scandal has arisen, so far as is generally known, in only a single case, which occurred in Hartford. The experience and observation of the writer have been limited to the single district of New Haven, which includes several towns and a greater population than any other district in the State. One lawyer has presided over the court continuously since the law went into effect.

It is expressly provided that the two physicians whose sworn certificates are required shall be "reputable physicians, * * * graduates of legally organized medical institutions," who "have been practitioners of medicine for three years within this State, and not connected with any asylum, nor related by blood or marriage to the complainant nor to the person alleged to be insane." The judge, as the law directs, appoints one of these physicians, and usually selects some one who has not been suggested by any of the interested parties, and who has not hitherto had any connection with the case. He also, as the law does not direct, often appoints the other physician, selecting some one suggested by the friends of the person to be examined, generally the physician who has been attending the patient.

A large number of insane people are classed either as indigent persons or as paupers. An indigent person is supported in part by the State, and in part by himself or his friends. A pauper is supported in part by the State, and in part by the town to which he belongs. These two classes of insane persons, in accordance with an act passed sixteen days earlier than the one from which quotations have been made, and which went into effect on the same day as the latter, may also be committed to an asylum by a judge of probate, under conditions not very different from those which have been mentioned, except that it is directed that the judge shall appoint two physicians to make the examination, whose only necessary qualification is that they shall be respectable, and who report to the court after fully investigating the case, but are not required to present sworn certificates.

So much has been said and written in condemnation of the practice, which has prevailed in securing the testimony of physicians as experts, of each of the opposed parties employing physicians to testify in their respective interests, that it will be instructive to inquire what has been the result of leaving the power of appointment of medical experts in the hands of the judge. Probably no court will ever have a more honorable or a more conscientious judge than the court of probate of the dis-

trict of New Haven has had for the last four years. He has had as much opportunity as any judge is likely to have of knowing the scientific and moral qualifications of the physicians in his district. The experience there may fairly be regarded as an illustration of the best result which is likely to be obtained by entrusting the appointment of experts to a judge.

In the commitment of the large number of insane people classed as indigent persons and paupers, it is the duty of the town officials to take an active interest. Consequently it happens that the town physicians are appointed to examine many of these subjects, the judge usually following the custom of allowing the interested parties to suggest one physician, and the town officials naturally suggesting a town physician. As the other examiner some disinterested physician is appointed. What circumstances, besides their disinterestedness, influence the selection of these physicians it would be difficult to tell. If it is made in accordance with any definite or fixed principles, it is impossible, after considerable interested observation, to discover what they are.

Leaving out of consideration the town physicians, who obtain and hold their positions through political influence, it would not be easy to prove that the political affiliations of a physician influence the frequency with which he is appointed to examine persons supposed to be insane. On the contrary, there have been whispered complaints among a few physicians because they have rarely, or never, been appointed, although belonging to the same party as the judge. Nor do age and experience seem to be especially regarded in making these appointments. In fact it has been remarked that some of the younger men have been often selected. Furthermore, it does not appear that those physicians are called upon with especial frequency who are known to have taken more than usual interest in mental diseases, or who have studied the subject with more than usual enthusiasm and thoughtfulness. On the contrary, it would not be surprising if an impartial inquiry should show that the opposite was the rule, with few exceptions. For instance, a homeopathic oculist was appointed to examine an insane woman who had been under the writer's care, and concerning whom he also was permitted to testify.

Passing now from the appointment of physicians, a few remarks must be made concerning the manner in which their testimony is received. On appearing in court the physician is asked if he has examined the individual alleged to be insane, and what opinion he has formed. If the opinion is expressed

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that the person is insane, the questions are then asked: Why do you think that he is insane? What did he say or do which leads you to think that he is insane? Of course, in most cases, the person whose mental condition is the subject of judicial investigation is so manifestly insane that a brief relation of his acts and of his conversation is sufficient to convince any one of the nature of the case. But in all cases the judge seems to desire not only to hear the opinions of the physicians, but also to learn on what facts these opinions are based. In other words, he seems to consider it his duty to decide whether the symptoms observed by the physicians in any particular case indicate insanity.

In the cases which come within the jurisdiction of the court of probate under the Act of 1895, there is rarely much controversy. But both in the probate courts and in the higher civil courts there occasionally arise contests of considerable activity as to whether a person who has made a will, or who has executed other legal papers, was in his right mind at the time when he signed the papers in question. In these cases the parties to the litigation employ physicians to give expert testimony in regard to the mental condition of the individual, the legality of whose acts is questioned. The first thing which is considered by the litigants is to find a physician who will give such testimony as will benefit the side which employs him. The next consideration is to find a man who, while ready to give the desired testimony, will, also, on account of his public reputation, and by his manner in the witness-box, influence the judge and the jury to believe that he thoroughly understands what he is talking about, and that he is telling the truth. These cases sometimes afford opportunity for the expression of surprising differences of opinion by eminent and honorable members of our profession.

But it is of criminal cases, in which the defense of insanity is made, that the newspaper-reading public hear the most, and in regard to which their interest is most strongly aroused. In these cases a great deal depends upon the attorney for the State who examines the evidence against each prisoner, and presents it to the court in such a way as he believes will best secure justice to all parties. Ample provision is made that the accused shall have every opportunity to maintain the innocence of which our gentle laws assume him to be possessed.

Occasionally a man is arrested for some alleged crime of moderate gravity, such as being a tramp, who, in the opinion of the officers and others who see him, shows indications of insan-

ity. It may be known to some of them that he has previously been confined in an asylum. Under these circumstances the attorney for the State may ask one or more physicians to examine the prisoner, and to testify in regard to his sanity. If the judge, who presides at the trial, is satisfied that the prisoner is insane, he may direct the jury to return a verdict of "not guilty on the sole ground of insanity," and may then commit the prisoner to an asylum. Cases disposed of in this way are usually comparatively trivial.

On the other hand, it occasionally happens that a man commits a crime of striking folly or atrocious fiendishness, which entitles him to severe punishment. In these cases, when there seems to be no reasonable ground for defense, and no loop-hole for escape, it is a rather common expedient with criminal lawyers to set up the defense of insanity, and to introduce physicians to testify that, in their opinion, the prisoner was insane when he did the criminal act for which he is on trial. This is illustrated by the following:

Case.—*Charge of forgery. Defense of insanity.* A young man of good family was arrested for forging the name of a recent acquaintance to a check, and was bound over to the Superior Court. He seemed to be on the straight road to State prison, and not very far from it. Physicians were employed to examine him. After repeated interviews, in the intervals between which he was visited frequently by his attorney and other friends, it began to appear that he had delusions that considerable property belonged to him, and that his devoted mother was wronging him, by not allowing him to spend it. The concurrent testimony of several highly reputable physicians that he was insane saved him from being sent to State prison. There was such unanimity of opinion among all the lawyers and physicians concerned in the case, as to what disposition should be made of the accused, that the court was not delayed by a discussion as to whether he had the delusions at the time when he forged the check, or whether at any time the delusions were genuine.

There was read at the last meeting of this society, by the distinguished psychiatrist who does us the honor of presiding over our present discussions, a report of the case of a man who in a single afternoon shot and killed two women, one his wife, the other his mother-in-law. It is rather peculiar that there has never been opportunity for the public expression of any difference of opinion in regard to this case. At the time when the paper was read the presiding officer invited no discussion upon it, and at the time appointed for the trial of the prisoner

there was essential agreement between the lawyers engaged in the case and the doctors who had been invited to examine him. With as little formality as possible this man was relieved from the necessity of expiating his crime with a rope around his neck, but was sent to the hospital provided for those who are afflicted with mental diseases, in the delightful county seat of Middlesex. My connection with this case was limited to the making of post-mortem examinations of the bodies of the two women who were killed. Consequently I am not prepared to express any opinion in regard to the man's mental condition. But even if I had examined him, and had reached the conclusion that he was not insane, I am sure that every gentleman present would consider me presumptuous if I ventured to express an opinion at variance with that of the respected and conscientious alienist and the no less distinguished surgeon to whom, by the grace of judge and attorney, this multi-woman-killer owes his precious life. I must confess, however, that I have never been able to entirely smother the suspicion that if this case had been prosecuted with the same energy which the same attorney for the State has exhibited in many other cases, the outcome for the prisoner might have been very different. He certainly would have passed a good many hours of uncomfortable suspense while the testimony was being given, while the lawyers were making their arguments, while the judge was giving his charge, and while the jury were trying to agree upon a verdict.

Far be it from me, while expressing this sentiment, to cast the slightest shadow of doubt upon the sincerity and honesty of purpose of any of the honorable gentlemen who were connected with the case. But such thoughts as I have expressed will, I am sure, not seem so very strange to you, if you will go back not quite eighteen years in the history of medical jurisprudence, and recall the case of Charles J. Guiteau, who shot a President of the United States and inflicted wounds which ultimately proved fatal. You will recall how acrimoniously this case was discussed by students of mental disease of the greatest learning, the most extensive experience, and the most honorable reputations; and how men of this character gave directly opposite testimony, and how the jury found the prisoner guilty of murder, and how he was put to death. There is little reason to question that those men were equally learned, equally respected, and equally honest, but their opinions differed widely, and the decision of the jury, which met the approbation of nearly every one, resulted in the death of the accused.

Somewhat later, in Connecticut, a man became intoxicated and with a club inflicted such injuries upon his hired man that the latter soon died. The survivor of this little episode was arrested and taken to the county jail, where after he had learned of the death of his victim, he began to act in such a manner as to indicate that perhaps he might be insane. A young physician who had examined him testified that in his judgment the prisoner was not insane, while two older physicians—one an alienist of extensive experience, who has since died—testified that he was unquestionably insane. The fact that the accused had been a patient in an insane asylum confirmed all of the physicians in their respective opinions, the former believing that this experience had given him the opportunity of learning how to present a very good imitation of insanity, the latter believing that it furnished positive evidence of the existence of an insane diathesis. The jury, in spite of the preponderance of evidence in favor of his insanity, found him guilty—as indicted—of murder in the second degree, and he was sentenced for life to State prison, from whence—as the rumor goes—he was sent to the Mecca of neurotic criminals—Middletown.

I was once asked by the attorney for the State to examine a prisoner who had shot and killed a man without any immediate provocation, and whose attorney—subsequently the attorney for the man who killed two women—had suggested that the man might be insane. I could not satisfy myself that this was the case, and so reported. Thereupon the prisoner's attorney persuaded the attorney for the State to consent to the acceptance by the judge of a plea of guilty of murder in the second degree, and this man was sent to State prison.

These cases indicate some of the different ways in which criminals, whose mental condition shows more or less signs of impairment, are disposed of by the courts. It is difficult to avoid the conclusion that both judge and jury are influenced to a very moderate degree by the testimony of medical experts, if there is much difference in the opinions which they express.

It has happened that an expert has been brought from outside of the State to testify in regard to the mental condition of a prisoner on trial in the criminal court. This seems to be an uncalled for reflection upon the medical profession of Connecticut, and an unnecessary expense to be borne by her already overburdened taxpayers.

In many cases a brief interview gives one all the evidence necessary to enable him to arrive at the conclusion that the sub-

ject of inquiry is insane. But in doubtful cases one must avoid forming an opinion until all available evidence has been thoroughly considered. Repeated interviews should be had, and inquiry should be made from persons who have had the opportunity of observing him under other circumstances and at other times, so as to obtain a comprehensive idea of the character of his acts and conversation. Unless this rule is followed there is liability to error, as is illustrated in the case of a man who, on being examined some time after his arrest, showed no signs of delusions. At his trial, however, the testimony of witnesses showed that while he was committing the acts for which he was arrested, and at the time of his arrest, he showed unmistakable evidence of the existence of delusions.

In giving expert testimony in court a physician should carefully avoid going outside of his own field and attempting to discuss purely legal questions. He should, as a rule, confine himself strictly to an expression of opinion as to whether the individual whose mental condition is under consideration is sane or insane, and as to whether it is necessary or desirable that he should be confined in an asylum.

Mental diseases are so common that every physician is likely to be called to attend insane persons, and also to be called upon to testify in court in regard to those believed to be insane. Consequently it is the duty of every practitioner to become familiar with the different forms of insanity, and their diagnosis and treatment. In order that this may be accomplished the medical colleges should give more time to this subject. It should be taught by systematic recitations from a text book, supplemented by clinical lectures, and a thorough examination at the end of the course. A half dozen or a dozen lectures, with one or two visits to a large asylum, and one or two questions on an examination paper on the theory and practice of medicine, do not give a student an adequate preparation for the work in this department which he is likely to encounter early in his professional career.

The following conclusions are based upon the personal observation of the writer:

I. The appointment by judges of experts in insanity does not ensure the selection of the most competent men.

II. The employment of experts by the opposed parties results in the expression of the most diverse opinions.

III. When the opinions of medical experts differ very materially, neither judge nor jury seems to be influenced very much by them in deciding upon a verdict.

LYMPHOID HYPERTROPHIES OF THE PHARYNGEAL VAULT.*

BY DR. CARL E. MUNGER,

Assistant Surgeon, Manhattan Eye and Ear Hospital, New York; Laryngologist and Aural Surgeon, Waterbury Hospital, Waterbury, Conn.

To Meyer, of Copenhagen, the children of the world owe an obligation to an extent which is not easily estimated. To him is due the credit for bringing to the notice of the medical profession an appreciation of the pathological significance of the presence of certain lymphoid structures which are situated in the naso-pharyngeal vault, and which when they have undergone an hypertrophy carry in their train untoward symptoms, which if unrelieved are the source of distressing and lasting ill effects, producing deafness and chronic ill health, and interfering with proper developement of body and intellect.

Within the last few months a monument to his memory has been unveiled in the city of Copenhagen, not by his own townspeople, or indeed by the country in which he lived, but it was erected by international subscriptions from the whole civilized world. It is rare indeed that any Doctor of Medicine has been so honored. And why was he so conspicuous and why was he deemed so worthy of distinction? Because in 1872 he wrote a treatise on adenoid vegetations, (1) based on the study of 102 cases, which was so complete and classical that it forced itself upon the attention of the medical profession and was the means of relieving thousands or unfortunate children from deafness and giving them an opportunity to properly develop. Although volumes have been written on this subject since that time, very little of real value has been added to, and nothing whatever has taken away from the deductions which Meyer brought to light.

I take the liberty of writing on this subject because I am continually impressed with the fact that the general practi-

* Read before the Connecticut State Medical Society, Hartford, May 25, 1899.

tioner either is not familiar with the subject except in a very vague way and does not connect certain trains of symptoms with the pathological condition which obtains in the naso-pharynx, or that he underestimates the presence of this hypertrophy as a predisposing factor in many infantile and children's diseases; and this is unfortunate, as he it is who is constantly coming in contact with these cases, and he it is who determines whether or no this condition exists, and who dictates whether or no any procedure, operative or otherwise, shall be entered upon. Whenever a child is brought to you with the following history of mouth breathing, snoring, restlessness during sleep, frequent attacks of undefined illness of a few hours or two or three days' duration, with a febrile action, frequently an increasing deafness, and still more frequently attacks of earache, a vacant expression of the countenance, with an inability to pronounce certain words clearly, due to the interference of nasal resonance, you may be reasonably sure that you will find a naso-pharynx that is more or less blocked with an irregular mass of tissue which is a diseased, inflamed and enlarged growth of the lymphoid structures which are normally present in this situation. Upon examination you will find that there is present more or less complete nasal stenosis which is not due to any stoppage in the nose itself. When you look in the mouth you will find the hard palate very highly arched and a correspondingly near approach of the two sides of the upper jaw to each other. Hypertrophied tonsils may or may not be present. On depressing the tongue the enlargement of the so-called adenoid vegetations may extend so far down the posterior pharyngeal wall as to be visible, or these may be seen by pulling the soft palate upwards and forwards with the palate hook. A rhinoscopic examination will in tractable children, or rather, children with tractable throats, demonstrate the presence of the hypertrophied lymphoid tissue, and these means failing, digital palpation is a sure means of determining the presence or absence of these growths.

SYNONYMS.—Hypertrophy of the pharyngeal tonsil, or Luschka's tonsil, adenoid growths, adenoid vegetations, adenomata of the pharynx, post nasal vegetations. The symptoms present in this condition of naso-pharyngeal obstruction are numerous and marked. The most common subjective symptoms are—a vacant expression of countenance, mouth breathing, snoring, restlessness, night terrors, incontinence of urine, malnutrition, deafness, nasal stenosis, loss of nasal resonance, constant tendency to catch cold and aprosexia or inability to apply oneself

to mental exercise; of the objective symptoms the most marked are—the ever open mouth, the pinched nose, the arched palate and the mass of hypertrophied lymphoid tissue in the nasopharyngeal space.

PATHOLOGY.—These vegetations are the hypertrophies of the lymphoid glands that are normally present in this location, and consist of lymphoid follicles embedded in the retiform adenoid tissue of His, and are bounded apically and laterally by columnar ciliated epithelium. (2). The prognosis of the growths and the prognosis of the patients having them is not one and the same thing. At from 18 to 25 years of age these growths usually become more or less atrophied, and cease to be troublesome mechanically, but there is very apt to be left a chronic inflammation of the pharyngeal glands which will require proper treatment; but the condition of the child with these vegetations usually continues to grow worse—if there is deafness present it gets more deaf—if there is a purulent discharge from the ear it continues to discharge, with the ever ready tendency for the mastoid or the brain to become involved. The child remains puny, is stupid, ever falling behind its companions in school, and instead of developing into a strong, bright, active youth, continues to carry the vacant expression, and is handicapped for life because he cannot breathe properly at the most important period of his development.

ETIOLOGY.—Many causes have been suggested as being responsible for this condition. It is essentially a disease of childhood, and is undoubtedly sometimes congenital. (I have myself found adenoids vegetations sufficient to produce complete nasal stenosis in a child six weeks of age.)

Scrofula, the exanthemata, rheumatism and diphtheria have all been considered causative of the growths. Heredity undoubtedly plays a prominent part in predisposition, this condition not infrequently being present in several children in the same family. The condition lymphoid diathesis (3) is present very frequently in childhood, and is probably the most important factor in causation. Frequent inflammations of the nasopharyngeal vault will, no doubt, sometimes cause these enlargements, as in childhood lymphoid tissue is ever ready to become hypertrophied. A large proportion of deaf mutes suffer from adenoid growths, Wioblewsky finding adenoid hypertrophies in 57.5 per cent. of a large number of deaf and dumb children which were examined by him.

TREATMENT.—For the relief of this condition there is but one indication—removal of the offending mass—all other measures

are faulty and will give only disappointment in their use. As to the method of removal, that seems to depend on the habit of the practitioner.

Snaring with the cold wire snare, or galvano-cautery snare either through the nose or through the mouth. Scraping with a curette or by means of the finger guard surmounted with a scooped-shaped spoon, or by means of the finger alone, or removal by means of the various shaped cutting or pinching forceps. These growths may be removed while the child is conscious, or while under the influence of general anæsthesia. The objections to operating without anæsthesia, are the difficulty of thoroughly removing the growth in a struggling child, and the terror which impresses him at the time of operation and which makes him very unwilling to visit you again. Of the general anæsthetics which may be used, the most popular are nitrous oxide gas, chloroform and ether. The nitrous oxide gas produces an anæsthesia which is very short and makes it very difficult to thoroughly remove these growths unless there is a high degree of rapidity and expertness used. Chloroform is the most satisfactory and the pleasantest apart from the element of danger which is ever present in its use. There is at the present time a disposition to deprecate the use of chloroform for the removal of these growths, for the reason that there have been several deaths under its use in these cases, and that there seems to be a feeble resisting power in children with the lymphoid diathesis or the *habitus lymphaticus*.

Ether may be used in one of two ways. Frequently the primary stage of anæsthesia will give sufficient time for the removal of the growths, and eliminates the occurrence of vomiting and the swallowing of blood. Complete ether anæsthesia is perhaps the most satisfactory method, and one which is most generally used in this country. The after treatment consists in quiet for the patient and exercising precaution against his catching cold after the operation. Local cocaine anæsthesia is used with much success in adults.

RECAPITULATION.—Naso-pharyngeal lymphoid hypertrophy is of very frequent occurrence in childhood, its symptoms are marked and unmistakable, its removal is easily accomplished, recovery from operating very sure, and the good results produced by operating are pronounced and brilliant. The puny child gains flesh and becomes hardy, the nervous child ceases to be nervous, the deaf child gains its hearing. The backward child acquires ease in studying, and the vacant expression of countenance changes to that of intelligence; in short, the child who

has been handicapped by disease is now able to take his place in the world with an ease and success which would have been impossible without the removal of these lymphoid hypertrophies, and as a last word I would suggest, that following out the present tendency to have systematic examination of school children's eyes, it may be just as essential and just as beneficial to have the children's throats examined, the presence of these growths demonstrated and their removal accomplished.

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At the last meeting of the Editors of the JOURNAL, Frederick Coonley was elected *Chairman*, H. C. Pitts, *Business Manager*, and W. E. Balmer, G. L. Buist, Jr., and J. F. Quinn, *Editors*.

* * * *

At the recent meetings of the Hartford and New Haven County Medical Societies subjects of great importance to Life Insurance were discussed. Dr. E. K. Root presented a paper on "The Differential Diagnosis of Cardio-Vesicular Murmurs," at Hartford, and Dr. C. S. Rodman read, in this city, a paper on "The Relation of Albuminuria to Life Insurance." Both of these papers emphasized the necessity of very careful and oft-times repeated examinations in order to protect the companies. This is necessary and just, but we feel that a great injury has been done a certain class of applicants for Life Insurance in rejecting them on the ground of organic heart or kidney lesions after a hasty or superficial examination. Once rejected, owing to the methods of self-protection now employed by the conservative insurance companies, an applicant's name is placed upon the general rejected list, and in the future he can secure the advantages of insurance only with great difficulty.

Dr. Root pointed out a murmur which has been described by careful observers in examining a nervous patient for the first time. At the apex of the heart there is heard a soft, blowing, systolic murmur, which is changed by respiration, but is not transmitted in any direction, nor is it constant. This is functional and entirely without moment or consequence to the risk. It is many times mistaken, however, as indicating a mitral or tricuspid lesion, a haemic murmur, or a pericardial friction rub.

The previous history, the appearance of the patient, and the size of the heart will exclude these conditions. This "cardio-vesicular murmur" will generally disappear on holding the breath, or on lying down a few moments. There is a slight chance for error here, for the heart in beginning hypertrophy may give a similar murmur, but this can be excluded by subsequent examinations. The explanation offered by Dr. Root for this condition was that by excitation the heart is stimulated to more forcible contractions, and by thus forcing the air from the vesicles of the overlying lung tissue, gives rise to the soft, blowing murmur.

Dr. Rodman described the latest and most exact methods of detecting the presence of albumin in the urine, which he showed were necessary for the examiner to employ in order to fully protect the insurance companies. There is, however, the functional or so-called physiological albuminuria, which may follow muscular work, the ingestion of foods rich in albumin, violent emotions, cold bathing, and dyspepsia. The albuminuria of adolescence and cyclic albuminuria are interesting and must be carefully considered before permanently rejecting a case.

For years the insurance examiner rejected at once an applicant in whose urine traces of albumin had been found. Recently, however, with an increasing knowledge of the significance of albuminuria and its prognosis in kidney lesions, which was another topic discussed at the New Haven County Medical Society meeting by Dr. C. A. Tuttle, the insurance companies are willing to postpone and reconsider cases in which traces of albumin are found, or where there is reason to expect a functional disorder.

It is easier for the examiner to waive all responsibility by rejecting a doubtful case, than by careful and frequent examinations to pass him. To further emphasize the importance of care on the part of the examining physician, mention may be made of dietetic glycosuria and the raising of blood that may or may not be from the lungs, both of which conditions may

not impair a risk, yet a hasty diagnosis will injure the applicant. We are pleased to note that self-protection and the struggle of competition has aroused the insurance companies to demand a more scientific examination of applicants, and also that their new table of expectancy allows them to issue policies to impaired risks at an increased premium. We would again emphasize the fact that the rights of the applicant demand the greatest skill of the physician in distinguishing between functional and organic disturbances.

MEDICAL SOCIETY REPORTS.

The annual meeting of the Middlesex County Medical Society for 1899 was held April 20, at the County Home for Orphans, in Haddam. President John E. Loveland called the meeting to order at 10.30 a. m. The following officers were then elected by ballot: President, Arthur J. Campbell, of Middletown; Vice-President, George N. Lawson, of Middle Haddam; Clerk, Frank K. Hallock, of Cromwell.

Dr. A. R. Defendorf, of Middletown, M.D., Yale, '96, and Dr. Emma J. Thompson, of East Haddam, M.D., Woman's Medical College of New York Infirmary, were proposed for membership. Drs. Hazen, Murphy and Lawson were appointed a Committee on Credentials. During the retirement of this committee the following officers were re-elected: Censors, S. W. Turner, G. W. Burke and M. C. Hazen; County Reporter, G. N. Lawson. The Committee on Credentials reported favorably on the admission of Drs. Defendorf and Thompson, and they were elected to membership. The resolution passed at the previous annual meeting, requiring candidates for admission to possess a certificate from the State Board of Examiners, was then considered. It was voted not to insist on this rule in all cases, *e. g.*, physicians retired or not in active practice. Drs. Mead, Loveland and Hallock were appointed a Committee on New By-Laws. Drs. Loveland, Murphy and Potter were appointed a committee to report on what action our County Society should take in reference to the "lodge contract system."

Dr. Kate C. Mead read a paper entitled, "Theory and Uses of Vibration as a Form of Massage." Discussed by Drs. Cholehun, Stanley, Hazen, Lawson and Hallock.

Dr. Charles E. Stanley read a paper entitled, "The Relation of Pulmonary Tuberculosis to Insanity." Discussed by Drs.

Colehun, Hazen, Rotter, Hallock, Downey, Defendorf, Loveland, Lawson, Granniss and Cowles.

Dr. H. T. French reported verbally, "A Case of La Grippe with Fatal Termination." Discussed by Drs. Granniss, Colehun, Loveland and Hallock. The latter expressed the opinion that the fatal termination was due to the condition called "Sinus Thrombosis," resulting from an infective otitis developed in the course of La Grippe.

2.00 p. m. Called to order for afternoon session.

The committee on the "lodge contract system" made no definite report, but asked a general expression of opinion. After an animated discussion, the Society endorsed the action of the State Society.

The election of Fellows for 1899 resulted as follows: Fellows: Nichols, Smith, Hazen, Granniss, Cowles; Alternates: French, Turner, Colehun, Plumstead, Bloomfield. Dr. Nichols was elected a member of the Nominating Committee. Drs. Hallock, Calef and Page were elected delegates to the American Medical Association.

Delegate to Hartford County Association, Hubbard; alternate, Field.

Delegate to New Haven County Association, Reynolds; alternate, Matthewson.

Delegate to New London County Association, Buch; alternate, Spencer.

Delegate to Fairfield County Association, Bidwell; alternate, Nolan.

Delegate to Windham County Association, Bloomfield; alternate, Condert.

Delegate to Litchfield County Association, Noble; alternate, Murphy, J.

Delegate to Tolland County Association, Maitland; alternate, Bailey.

Dr. Miner read a paper entitled "Reminiscences of Medical Men."

It was voted to refer all papers to the Committee on Publication of the State Society.

The invitation of Dr. Page to have the semi-annual meeting at the State Hospital for Insane, at Middletown, was unanimously accepted.

Drs. F. S. Smith and M. W. Plumstead exhibited pathological specimens. The meeting then adjourned.

LITCHFIELD COUNTY MEDICAL ASSOCIATION.—The annual meeting of the Litchfield County Medical Association was held at Winsted, April 25. The following members were elected officers for the next year: President, E. H. Welch; Vice-President, J. L. Buel; Clerk, J. C. Kendall; Reporter, Elias Pratt; Censor, S. G. Howd; Fellows, J. C. Kendall, J. S. Bissell, A. J. Barker, W. M. S. Curtis, F. H. Lee; Delegates to the American Medical Association, L. D. Buckley, R. S. Goodwin, T. S. Hanchett, W. S. MacLaren, E. H. Welch. Dr. F. M. Wilson was present as delegate from Fairfield County and Dr. E. P. Flint as delegate from Tolland County. Dr. Wilson read an interesting and valuable paper on "Infective Otitis." Drs. H. B. Griswold, of New Milford, and W. S. Munger, of Watertown, were, at their own request, dismissed from membership. The following resolutions were unanimously passed by the Association: "Resolved, That a tax of one dollar be laid upon the members, and that the Clerk pay from the treasury for the dinner of members who attend meetings." "Resolved, That the Association endorse the resolutions passed at the annual meeting of 1898 relative to contract professional work."

NEW HAVEN MEDICAL ASSOCIATION.—A regular monthly meeting of the Medical Association was held on Wednesday evening, May 3, 1899. The President, Dr. F. W. Wright, presided. There were present as guests Drs. F. H. Wiggin, of New York, Smith, of Whitneyville, and Kilbourne, of New Haven. Dr. Wiggin read the paper of the evening, entitled, "Malignant Disease of the Uterus, its Diagnosis and Treatment." Dr. Carmalt opened the discussion on the subject of the paper, and Drs. Hotchkiss, Gilbert, Tuttle, Osborne, Eliot, Swain and Mailhouse followed. The association gave a vote of thanks to Dr. Wiggin for his instructive paper.

THE NEW HAVEN MEDICAL ASSOCIATION held its regular meeting on Wednesday evening, May 17, 1899. The President, Dr. Frank W. Wright, presided. Dr. R. A. McDonnell related the case of a young man, aged 20, who was suffering from annular, vesicular eruption of the hands, forearms and feet. Individual lesions were typical examples of herpesiris, and the diagnosis made was erythema exudativum multiforme. But a condition which troubled him more than the eruption was a stomatitis, the border of the tongue being eroded, the mucous lining of the lips and inner sides of the cheeks covered with superficial ulcers, the lips everted and oedematous, and the gums (to a less extent, however) inflamed. It was suggested that the decreased

alkalinity of the blood present in erythema multiforme might have so altered the composition of the saliva that it reacted on the amalgam filling in the patient's teeth, causing mercurial stomatitis. The patient gave a history of three similar attacks previously. The case was discussed by Dr. Alling.

Dr. Wright related the case of a lady supposedly five months pregnant, who had several hemorrhages, and finally, a month ago, was taken with severe pain and hemorrhage. Upon examination, a placenta was found presenting, and a diagnosis of placenta praevia was made. The placenta was hurriedly removed piecemeal, and was estimated to amount to about the size of a five months' placenta. But no foetus came away, either before or since, and the patient has now recovered her health. The case was discussed by Drs. Alling, Eliot and M. C. White, the latter relating several similar cases known to him.

Dr. Swain related the case of a child ten years old, who had several times suffered from attacks of middle ear catarrh, the ear at first aching, then discharging, and finally getting well. While at school recently she was taken with earache again. The next day (Friday) the ear began to discharge. On Saturday the discharge stopped, and the earache became more acute. At this time a physician was called. He found the child stupid and with a temperature of 103° . On Sunday morning she had severe headache, and was nearly comatose, but would answer questions if they were shouted at her. The ear was very sensitive. About this time the discharge commenced again. Dr. Swain saw her and found her temperature 104° . He used Politzer's method of blowing out the ear successfully, and drainage was established. But the child died of meningitis on Wednesday. The case was discussed by Dr. White.

Dr. Wheeler then opened the discussion on the question for the evening—"The Diagnosis of Diphtheria," and was followed by Drs. Foote, White, Daggett, Arnold, Eliot and Wright. The Question Committee reported that Dr. Peck had promised a paper for the next meeting on "A Case of Lead Encephalopathy."

CONNECTICUT STATE MEDICAL SOCIETY.—The 107th annual meeting of the Connecticut State Medical Society was called to order by the President, Dr. Henry P. Stearns, of Hartford, at 11:45 Wednesday morning, May 24th. The meeting was held in the Hunt Memorial Building, the new home of the Hartford Medical Society. Roll call showed a fair number of Fellows present. The President gave a short address of welcome, in

which he reviewed the steady growth of the society, and spoke particularly of the decided and gratifying increase of interest shown in the proceedings. He strongly recommended higher requirements for graduation from our medical colleges; spoke of the desirability of unifying the medical examination boards of States of one section of the country, and heartily endorsed various changes in the by-laws and certain resolutions proposed by the committee on legislation. He referred to the deaths of Drs. Stickner and Lusk, former members, with a short review of the latter's life.

At 12:30 the meeting adjourned for lunch. Business was resumed at 2 P. M. The reports of the various committees were heard and accepted. The president announced the receipt of a communication from the promoters of the Medical Congress to be held in Paris in 1900, asking for the co-operation of the society in furnishing delegates and leading articles. Dr. W. H. Carmalt, of New Haven, moved that the communication be acknowledged and that the President appoint a committee of five to act in accordance with the request. At 4 the nominating committee, composed of Drs. James Campbell, W. K. Tingley, T. M. Hills, E. P. Nichols, W. H. Carmalt, A. E. Barber, J. C. Kendall and A. R. Goodrich, presented the following nominations: President, C. S. Rodman, of Waterbury; Vice-President, L. B. Almy, of Norwich; Treasurer, W. W. Knight, of Hartford; Committee on Matters of Professional Interest in the State, T. T. Simpson, of Putnam, J. G. Stanton, of New London, and L. W. Bacon, of New Haven; Committee to Nominate Physicians to Retreat for the Insane, J. B. Kent and F. D. Edgerton; on Publication, W. E. Wordin, ex-officio, J. A. LaPierre and O. T. Osborne; Honorary Members and Degrees, S. B. St. John, J. W. Grannis and George L. Porter; Arrangements, J. A. Seaver, Gilbert, F. H. Wheeler and C. P. Lindsley, with R. A. McDonnell as anniversary chairman; C. B. Graves, of New London, to the place left vacant by the expiration of L. B. Almy's term on the Committee on Medical Examinations; Dissertator, F. W. Wright; Alternate, J. S. Ely; Delegates to the American Medical Association in 1900, C. J. Fox, G. R. Shepherd, P. Cassidy, F. W. Wright, J. D. Bulkley and J. M. Keniston; to the Maine Association, T. M. Hills and P. H. Ingalls; to the New Hampshire Association, R. Robinson and E. Pratt; to the Vermont Association, James Campbell and T. B. Bloomfield; to the Massachusetts Association, W. H. Donaldson and H. G. Howe; to the Rhode Island Association, H. L. Hammond and W. H. Judson; to the New Jersey Association, R. W. Kimball and F.

W. Wright; to the New York Association, E. Pratt, M. C. Hazen, T. F. Rockwell and F. S. Cowles.

The nominees were unanimously elected.

In the report of the Committee on Legislation it was brought to the notice of the society that Connecticut was the first State to institute a systematic examination of the eyes of school children.

All business was finished and the meeting of the President and Fellows declared to be over at 4:15. Immediately after, the annual convention was called to order. A goodly number of members was present. The annual report of the Secretary, N. E. Wordin, was read and accepted. After the reports of the delegates from other societies were heard, two extremely interesting papers were read; one on the "Decimation of the Race by the Tubercle Bacilli," by E. P. Douglass, of Groton, and the other on "Our Legal Responsibility in the Treatment of Fractures," by A. G. Cook, of Hartford. This last called forth a very lively discussion, in the course of which the opinion was expressed that brother practitioners are very often responsible for mal-practice suits, and that when a more kindly, helpful feeling becomes manifest, legal complications will be much more infrequent. The meeting adjourned at 5:50. In the evening the Hartford Medical Society tendered a reception to the members of the Connecticut Medical Society and the delegates from other societies at the Hunt Memorial Building. A large number were in attendance and were most heartily entertained.

Session opened on the following morning at 10.30. A Report on the Progress of Medicine was first given by Drs. E. K. Root, of Hartford, and O. T. Osborne, of New Haven. Dr. Root took as his subject, the "Serum Treatment of Disease." He reviewed the progress made along this line and spoke of the great field here open for further investigation. Dr. Osborne dwelt at length on the value of the various glandular extracts. F. T. Simpson, for the Committee on Matters of Professional Interest in the State, read an exceedingly interesting paper on the "Spread and the Prevention of Tubercular Disease." Its spread is so largely due to the careless disposal of sputum that he recommends very strongly acquainting the mass of the people of this fact, warning them of the great danger of infection and asking their support in the effort to obtain suitable legislation. C. C. Beach, of Hartford, followed with a dissertation on "Insects as Carriers of Diseases." He gave an exhaustive review of the various diseases that are known to be transmitted by insects, and

from the great spread of typhoid in our camps during the Spanish-American war, referred to the possibility, and more than that, the probability of its germs being carried by flies. At 12 m. the President delivered his able and interesting address on the "Irresponsibility of the Insane." Dr. Storr's motion thanking the President for the pleasure given his listeners was unanimously adopted.

The afternoon session was opened at 2.00 P. M. by the reading of a paper on "Normal Breathing in the Treatment and Prevention of Tuberculosis," by G. J. Holmes, of New Britain. This was followed by an able paper on "Insanity in its Medico-Legal Relation," by Gustavus Eliot, of New Haven. "Lymphoid Hypertrophies of the Pharyngeal Vault," was the title of C. E. Munger's, of Waterbury, most interesting paper. General practitioners, he thought, were not sufficiently familiar with the early symptoms in this condition. This is particularly unfortunate, too, because they are the first to come in contact with such cases. He suggested that it might be wise to institute a systematic examination of the nasal passages as well as the eyes of school children. L. B. Almy, of Norwich, in his paper on the "Diseases Met with During the Spanish-American War," spoke of the almost constant association of some form of malaria in the typhoid among the soldiers coming from Cuba. Conditions at Montauk were not as black, he thought, as painted. Reporters had told him personally that they were under orders to write up only the blamable things seen. It was his opinion that some 75 cases of yellow fever of a mild type either developed in or were brought to Wickoff.

A report on the Progress of Surgery was presented by M. M. Johnson, of Hartford. After this, Dr. E. D. Clarke, visiting delegate from the Rhode Island Medical Society, was received.

The next paper was an exceedingly practical one on "Whooping Cough," by W. H. Donaldson, of Fairfield. He recommended local antiseptic treatment most heartily, and suggested formaldehyde as the one found most useful in his own practice. A case of fracture of cervical vertebra, with recovery, was presented by J. E. Root, of Hartford.

W. L. Barber, of Waterbury, then read on the "Outlook for the Doctor." After the reading of a report of "Injury to the Spinal Cord in the Dorsal Region, with Autopsy," by Ida Gridley-Case, and the presentation of the following resolutions by the Secretary, the 107th annual convention was voted adjourned.

WHEREAS, consumption, the most prevalent and most fatal disease among us, has been found to be infectious and therefore preventable, and

WHEREAS, we believe it to be our duty as physicians to inform the public of this fact, as the first step toward stamping it out, therefore be it

Resolved, That through the public press we announce to the citizens of our State that the disease commonly known as consumption is not hereditary, but acquired; that it is caused by a germ; that that germ is found in the sputum of the person sick of the disease, and that by the complete destruction of all such sputum, may be caused to disappear.

Resolved, That as physicians we believe that consumptives in hospitals should be in a ward by themselves, and that, therefore, a hospital for consumptives should be built at the expense of the State.

Resolved, That the county associations be called upon to agitate this subject and to bring it before their members, so that we may be prepared to act intelligently in the future.

The annual dinner at Putnam Phalanx Hall put the finishing touches to a most successful meeting.

MEDICAL PROGRESS.

CLINICAL EXAMINATIONS OF THE BLOOD-PLATELETS.—(*Deut. Archiv für klinische Medicin.*) Determan has made a careful study of the blood-platelets with special reference to their origin. He first describes the physical and morphological characteristics of the platelets in ordinary fresh blood, in specimens diluted with some preserving fluid and in stained preparations. The most satisfactory staining and preserving fluid for studying the platelets in the fresh blood is Bizzozero's fluid, consisting of a 0.9 per cent. solution of sodium chloride to which a concentrated aqueous solution of methyl-violet in the proportion of one drop of the latter to 10 c. c. of the former is added to prevent the natural tendency of the platelets to run together. The finger is pricked, a drop of the fluid placed on the incision and the blood allowed to run into it. In healthy individuals the ratio of platelets to red corpuscles ranged between 1:18 and 1:30. In some chronic diseases the platelets are enormously increased, the proportion to reds often reaching 1:1. In two cases, one of arthritis deformans and the other of myelitis, they exceeded in

numbers the reds, the ratio being 2:1 and 4:1, respectively. In regard to their origin, Determan holds with Arnold that they are derived from the red blood-corpuscles. Preparations of blood were made with the greatest care, in capillary tubes to prevent the action of the air, and in these preparations Determan found that after twenty-four hours the red blood-corpuscles show definite buds on their surfaces, which at first are attached to the cell by protoplasmic process and show hæmoglobin. Later the buds become separated from the cell, lose their hæmoglobin and become indistinguishable from the ordinary blood-platelet. After forty-eight, seventy-two hours, and longer, these changes become more marked and the separated, decolorized, granular portions more numerous. The blood was examined in many cases of anæmia and chlorosis and the budding process was found to be much more marked than in normal blood. As a results of his observations, Determan believes that the blood-plates are, for the most part, not preformed elements, but derivatives of the red blood-corpuscles. He believes that the number of platelets in the blood is an index of the power of resistance of the red blood-cells at any particular time. He thinks that the platelets are of prognostic value in that they are an expression of the vitality of the red blood-corpuscles.

THE TRUE FUNCTION OF THE THYMUS.—(*The Lancet*, Jan. 21, 1899.) Dr. Beard made an exhaustive study of the thymus gland, using the thymus of the smooth skate. Since Kölliker discovered that the thymus originated in mammals from the epithelium of a gill pouch, and since he stated the original epithelial cells gave rise to lymph cells or leucocytes, two views have been held regarding the function of the gland. Steida and His holding that the leucocytes, which always form an integral part of the gland do not originate there, but are transported, probably from the mesoblast. They make no attempt to associate Hassal's concentric corpuscles with the formation of leucocytes. They hold that these corpuscles are formed from the original epithelial cells, and the function of the gland is still absolutely unknown. Kölliker first discovered that for a relatively long period of foetal development the blood contained only nucleated red blood corpuscles and no leucocytes. The latter do not appear until some lymphoid organ is developed. Beard was able to demonstrate, in the embryos of the skate, the transformation of the epithelial cells of the thymus into leucocytes. At first the protoplasm becomes more refractive, and in favorable sections takes

on a brownish tinge. At first there is no change in the nucleus which is oval as in other epithelial cells. Then it becomes rounded and gradually the whole cell assumes this shape. With this and the marked refractile character of the protoplasm the cell, according to Beard, takes on the character of a leucocyte. These leucocytes for a time remain within the mass of the epithelial cells, and later can be seen to migrate, one by one, into the mesoblast and elsewhere. He states that they do not wander into the epithelium of the thymus because, until some are formed within the latter, there is no place in the body whence they could be derived. In embryos a little older a few leucocytes can be found in the blood. Beard holds that the absence of leucocytes in the earliest period of embryonic blood in vertebrates persists until the first ones are formed within the thymus epithelium and from its epithelial cells. In embryos still older the formation and emigration of leucocytes from the thymus becomes very active, and at this time there is no part of the embryo, including the blood, that is not infiltrated with leucocytes. This happens before lymphoid structures are developed elsewhere within the body. Beard, then, believes that the formation of leucocytes is a function of the thymus. As a result of his work, he thinks that he has definitely proved that not only does the thymus form leucocytes, but that it is the parent source of all the leucocytes of the body.

HOSPITAL AND CLINIC NOTES.

THE NEW YORK CITY LYING-IN HOSPITAL.—The Society of the Lying-in Hospital of the City of New York completed its one hundredth year on September 30th last. The Society was organized in October, 1798, through the efforts of such men as Alexander Hamilton and DeWitt Clinton, and in July, 1799, sufficient funds had been collected to lease and equip a building for hospital purposes. This first building was at No. 2 Cedar street. The present Hospital, which is situated at Second avenue and Seventeenth street, is soon, it is hoped, to be replaced by a new building, which will cover the entire site now owned by the Society. It will have a frontage of one hundred and eighty-four feet, and will be ten stories high. The erection of this new hospital, for which \$2,000,000 have been offered to the Society by J. Pierpont Morgan, will be begun as soon as suf-

ficient income is provided to meet its running expenses. The Society is at present greatly hampered by its lack of accommodations, its hospital having been able to receive only three hundred and seventy-nine patients. That more facilities are urgently needed may be seen from the following facts taken from the Society's last report: For some time there has been no increase in the number of cases treated, because the Society is physically unable to care for more with the present plant. About twenty-five hundred cases have been treated during the year, and about half as many had to be refused. That there is urgent need of greatly increased facilities for the treatment of this class of cases in New York, is vividly shown by the fact that out of the fifty-one thousand births reported by the Board of Health for the year ending October 1, 1898, over twenty-three thousand mothers were dependent on the care of midwives, who for the most part are unskilled and ignorant.

FRIEDREICH'S ATAXIA—New Haven Hospital. Patient is a man 39 years old with fairly good muscular development. There is no atrophy of the muscles of the upper extremities and fairly good muscular power, facial muscles are in good condition and eyes can be closed tightly. There is no apparent atrophy of tongue muscles, but in protruding the tongue slight incoördination is noticed. In deep breathing there is a snoring expiration due to incoördination of pharyngeal muscles and also incoördinate attempts at swallowing. Associated movements are present in the opposite limbs upon exertion. Ataxic symptoms are marked in the upper extremities. In grasping an object the the hand moves about it for a moment, then suddenly seizes it. Elbow and wrist jerks are absent. There is no tremor, but mechanical muscular irritability is increased in both arms and legs. Muscles of the thigh are fairly firm, but calf muscles are soft and flabby and there is some atrophy of disuse. There are no fibrillary twitchings and superficial and deep reflexes are lost. Cremasteric reflex, ankle clonus and patella reflexes are absent. Incoördination of the legs is marked and ataxia is the same in the horizontal as in the upright position. A very striking feature is the advanced degree of talipes equinus and the dorsal flexion of the big toe. The patient is totally unable to stand unsupported. Marked scoliosis has been developed. The sphincters are uninvolved. The eyes follow steadily an object moved to and fro in front of them, but when looking to the side there is slight nystagmus. Pupillary reflexes to light and accommodation are unimpaired. In the upper extremities muscular

sense is almost unimpaired, there being, however, anæsthesia in the tips of the fingers. In the lower extremities there is marked anæsthesia and analgesia and a certain amount of delay. Muscular sense is fairly well preserved. Speech is slow and scanning and is much delayed with effort to make a beginning. Countenance is dull and apathetic.

There is no family history of any similar disease. The affection dates from about the fifteenth year of his age, coming on insidiously. When 22 he was obliged to give up work entirely, but continued to get around with difficulty for a few years, but subsequently became constantly confined to bed. He has been in the hospital three months, during which time his condition has remained unchanged.

NEW HAVEN HOSPITAL.—The number of internes in the New Haven Hospital has been increased from four to five and the term of service of eighteen months shortened.

The following is the division and duration of the new service :

1. Assistant physician—July 1 to November 1; Assistant Surgeon—November 1 to March 1; House Physician—March 1 to July 1. Twelve months' service.

2. Assistant Physician—November 1 to March 1; Assistant Surgeon, March 1 to July 1; House Surgeon—July 1 to January 1. Fourteen months' service.

3. Assistant Physician—March 1 to July 1; House Physician—July 1 to January 1. Ten months' service.

ITEMS OF INTEREST.

U. S. PHARMACOPŒIAL CONGRESS.

To all whom it may concern :

In accordance with instructions given by resolutions passed at the National Convention for Revision of the Pharmacopœia of the United States of America, held in Washington, A. D. 1890, I herewith give notice that a General Convention for the Revision of the Pharmacopœia of the United States of America will be held in the City of Washington, D. C., beginning on the first Wednesday in May, 1900. It is requested that the several bodies represented in the Convention of 1880 and 1890, and also such other incorporated State Medical and Pharmaceutical Associations, and incorporated

Colleges of Medicine and Pharmacy, as shall have been in continuous operation for at least five years immediately preceding this notice, shall each elect delegates, not exceeding three in number; and that the Surgeon General of the Army, the Surgeon General of the Navy, and the Surgeon General of the Marine Hospital Service shall appoint, each, not exceeding three medical officers to attend the aforesaid Convention.

It is desired that the several Medical and Pharmaceutical bodies, and the Medical Departments of the Army, Navy and Marine Hospital Service shall transmit to me the names and residences of their respective delegates, so soon as said delegates shall have been appointed, so that a list of the delegates to the Convention may be published in accordance with the resolutions passed at the 1890 Convention for the Revision of the Pharmacopœia, in the newspapers and medical journals in the month of March, 1900.

Finally, it is further requested that the several Medical and Pharmaceutical bodies concerned, as well as the Medical Departments of the Army, Navy and Marine Hospital Service, shall submit the present Pharmacopœia to a careful revision, and that their delegates shall transmit the result of their labors to Dr. Frederick A. Castle, 51 West 58th street, New York City, Secretary of the Committee of Revision and Publication of the U. S. Pharmacopœia, at least three months before May 2, 1900, the date fixed for the meeting of the Convention.

(Signed), H. C. WOOD.

President of the National Convention for Revising the
U. S. Pharmacopœia, held in Washington, D. C.,
A. D. 1890.

University of Pennsylvania, Philadelphia, Pa., May 1, 1899.

The committee of the Connecticut Medical Society has issued the following rules :

RULES FOR EXAMINATION.

1. Examinations will be held on the second Tuesday of March, July and November, at the City Hall, New Haven, beginning at 9:30 A. M., and lasting two days, closing at 4 P. M. of the second day.
2. Examinations will be conducted in writing in the English language.
3. Examinations for general practice consist of ten questions in each of the following branches :

1. Anatomy. 2. Surgery. 3. Materia Medica, including therapeutics. 4. Practice, including pathology and diagnosis. 5. Obstetrics, including gynecology. 6. Physiology. 7. Medical Chemistry and hygiene. Of these the candidate may elect any eight question on each subject.

4. In order to be admitted to practice, the applicant must attain an average of 75 on a scale of 100 in each and every branch. It is provided, however, that if the applicant falls below the required standard in only one or two branches, he may be conditioned for four months and appear for re-examination at the end of that time. If he then attain the requisite rank in the branch or branches in which he previously failed, he will be entitled to his certificate.

5. Applicants to practice midwifery will be examined in obstetrics only, and must attain an average of 75 on a scale of 100 to be admitted.

6. Examination fee, \$10.00, payable in advance. In addition to such fee the candidate shall, if successful, pay 20 cents, as required by revenue law, for revenue stamps. This sum to be sent to the secretary of the Examining Committee, upon receipt by the candidate of duplicate certificates.

7. Candidates once rejected must pay full fee on another trial. Candidates conditioned must pay five dollars on re-examination.

8. Graduates of medical colleges are requested to present their diplomas, for inspection to the secretary of the committee at the opening of the session.

The following questions were given to the candidates for a license to practice in the State of Connecticut. The applicant was permitted to select eight from questions given :

CHEMISTRY AND HYGIENE.

1. Give the chemical formulæ of (a) bromide of soda, (b) chloride of zinc, (c) sulphuric acid, (d) water.
2. What is meant by a chemical antidote?
3. Name the chief constituents of urine.
4. How would you determine the total daily amount of solids passed in the urine?
5. What is the source and significance of urea in the urine?
6. What is the average composition of pure atmospheric air? Give per cent. by volume.
7. What are the chief sources of contamination of the air?
8. What are the chief water-borne diseases, and how would you determine the germs of each in the suspected water?

9. What diseases would you report to the health officer?
10. How may immunity to yellow fever be acquired? How to smallpox?
How to rabies?

PRACTICE, PATHOLOGY AND DIAGNOSIS.

1. Give the clinical history of lobar pneumonia.
2. Differentiate between scarlet fever and measles.
3. Give the pathology of chronic diffuse nephritis.
4. What are the causes of hemorrhage of the stomach and intestines?
5. Pathology of endarteritis.
6. What are the symptoms of anterior, polio-myelitis?
7. Give the diagnosis of pericarditis.
8. Describe herpes zoster.
9. What are the symptoms of renal calculus?
10. Complications of typhoid fever.

SURGERY AND PATHOLOGY.

1. Describe the process of repair in an aseptic incised wound.
2. What is the difference pathologically and as to causation between dry and moist gangrene?
3. What are the symptoms, kinds and treatment of erysipelas?
4. What would you do in a case of strangulated indirect inguinal hernia?
5. Give differential diagnosis between chancre and chancroid.
6. What are the varieties of aneurism?
7. Describe the treatment of aneurism of the brachial artery.
8. What are the complications which may follow a simple fracture?
9. What is keloid?
10. What is the difference between Syme's and Pirogoff's amputation?

MATERI MEDICA AND THERAPEUTICS.

1. What is the physiological action of tartar emetic?
2. Contrast the action of strychnine and potassium bromide on the nervous system.
3. What are the physiological effects of chloroform inhalation? How do they differ from those of ether?
4. What are the physiological effects upon the eye of cocaine, of eserine, and how are these effects produced?
5. What are the symptoms of arsenical poisoning and the antidotes?
6. What are the therapeutic uses of cold?
7. What is the treatment of acute pleurisy?
8. Give the therapeutic uses of belladonna.
9. How would you treat a case of acute uræmia?
10. Write a prescription in Latin unabbreviated, containing four ingredients to be used in chronic bronchitis, and give the reasons for using each ingredient.

ANATOMY.

1. Give the points at which the cranial nerves issue from the brain.
2. Name the bones of (a) the skull, (b) the face.
3. Describe the gross anatomy of the spinal cord.
4. Describe the great trochanter of the femur, naming and locating accurately the attachment of muscles and tendons to its several parts.

5. Describe in detail the lesser omentum.
6. Name all the structures involved in the superior radio-ulnar articulation and describe how pronation and supination are accomplished.
7. Name and describe the action of the muscles of the posterior scapular region.
8. Give the surgical anatomy of the internal jugular vein.
9. Locate and describe the solar (epigastric) plexus.
10. Give the number, name and a brief description of the permanent teeth.

OBSTETRICS.

1. Give the boundaries and diameters of the pelvic outlet.
2. What is the usual position of the placenta and its functions?
3. Name and classify the diameters of the foetal head.
4. What conditions may be mistaken for pregnancy?
5. Give the causes of abortion.
6. Describe the symptoms and treatment of placenta previa.
7. Describe the mechanism of labor in the L. O. A. position.
8. Describe the symptoms of the puerperal septicæmia.
9. What are the causes and symptoms of puerperal eclampsia?
10. What is a dermoid cyst?

PHYSIOLOGY.

1. Discuss the constituents and coagulation of the blood.
2. Describe the circulation of the blood in the heart, and name the valves.
3. What is the nervous mechanism of respiration?
4. What is the physiological function of the stomach, and how is it performed?
5. What is animal heat, and how produced and maintained?
6. What is secretion and excretion, and give examples of each?
7. Name the different forms of muscular tissue, and give examples of each.
8. What is the origin and function of the sciatic nerve?
9. Draw a diagram illustrating the action of the crystalline lens.
10. What is metabolism?

Cornell University Medical College announces that it will conduct a Summer Course for students of all grades during the coming summer. The course will cover the period from May 15 to August 1, and the instruction will be chiefly clinical, with laboratory work and quizzes.

At a meeting, held last month, of the committee having in charge the preparation of a memorial to Dr. William Pepper, of Philadelphia, it was decided to erect a bronze statue of Dr. Pepper on the City Hall Plaza, and Drs. J. C. DaCosta, Alfred C. Lambdin, H. C. Wood, and Edward Brooks were appointed on the sub-committee having the matter in charge.

On March 13 Governor Roosevelt signed an amendment to the civil code, which has passed both houses at Albany. This amendment absolutely prohibits a physician from divulging any informa-

tion he may have acquired in his professional capacity concerning any patient, either before or after the latter's death. For a long time the insurance law has permitted a physician to testify concerning the physical condition of a policy holder.

A memorandum of the law of England relating to the obligation of medical practitioners with regard to professional secrecy has been prepared by Mr. Muir MacKenzie, at the request of the General Medical Council. It is declared that "a medical man not only may, but must, if necessary, violate professional confidences when answering questions material to an issue in a court of law." The New York law is directly contrary to English law in this respect.

Drs. Lang and Melzing, of Berlin, have presented an apparatus which they have invented for photographing the interior of the stomach. The tube, the end of which contains a microscopic camera, and an electric light, is inserted into the stomach. The negative is about the size of a cherry stone, but can be enlarged. When the stomach has been emptied and filled with air the photograph is made.

ALUMNI AND SCHOOL NOTES.

The results of the competitive examination for appointments in the New Haven Hospital, held May 23, are as follows: First place, F. G. Sloane, of the College of Physicians and Surgeons, New York; second, T. J. Bergin, and third, Dean Foster, both of the Senior Class, Y. M. S.

'51—In the last issue of the JOURNAL the death of Dr. Orlando Brown was recorded. This statement was made on apparently the most trustworthy authority. The statement, however, is incorrect, and the JOURNAL regrets the mistake.

'92—Dr. W. M. Kenna has moved his office from 129 to 245 Olive street, New Haven.

'93—Dr. Frederick B. Sweet was recently elected secretary of the Hampden County Medical Association.

'96—Dr. A. R. Defendorf has been elected to membership in the Middlesex County Medical Association.

'98—Dr. W. E. Ray has the July appointment in the Willard S. Parker Hospital, New York; also the March appointment in St. Mark's Hospital, New York.

'99—James Pullman has received first appointment in the Paterson General Hospital, Paterson, N. J.

'99.—The Senior Class will not issue any class book this year.

BOOK REVIEWS.

Traumatic Injuries of the Brain and its Membranes. By Charles Phelps, M.D. D. Appleton & Co.

Whether its title be altogether acceptable or not, this work is designed to, and does fill a place hitherto unoccupied in the study and systematic arrangement of material not as yet properly collated. In this respect the volume is decidedly in advance and opens an attractive view. A wide range of clinical and pathological horizon is disclosed, and the closer attention to its distinctive features cannot fail of interest and profit to the subsequent investigators; just as it has proved, to its learned author, to be teeming with data of first importance. Particularly is the collection of five hundred cases of brain injury a contribution successfully handled and highly valuable.

The section upon Pistol Shot Wounds of the Head is thoughtfully and beautifully done, and is finely illustrated with more than forty examples made from photographs, although it may be regretted that they include injuries almost exclusively of the temporal region.

Part of the text will not commend itself to all. For instance, the statement that "fracture of the vault is to be recognized by tactile and visual sense; that these methods are always practicable," etc., thus disregarding a considerable list of injuries wherein the fracture is not immediately provable without an incision, which latter may not be required by the exigencies of the particular case, nor the welfare of the patient. For, undoubtedly, many simple cranial fractures repair without the penalty of artificial compounding.

Probably the statement that "the hemorrhage from osteal vessels is never fatal," would be agreeable if in this context the results of such hemorrhage were specifically excluded. It is a relief to find him taking the correct stand that the simple operation of trephination is merely an incident in the treatment, and in nowise responsible for the result of a given case.

In general, the text is explicit and guarded to a fault, the author feeling that in the brain he has an uncertain factor to reckon with. Much of the subject is treated in the indirect and cumbersome terms of the psychologist, making heavy reading. The type, figures and binding are high in art, although the paper may be too glossy for many eyes.

On the whole, the work presents a valuable addition to our knowledge of brain injury, and must prove, when well known, a source of increasing satisfaction to the author and to the profession he has so ably served.

W. W. H.

Atlas and Epitome of Operative Surgery. By Dr. Otto Zuckerkandl, Privatdocent in the University of Vienna. Authorized translation from the German. Edited by J. Chalmers Da Costa, M.D.; with twenty-four colored plates and 217 illustrations in the text. Philadelphia: W. B. Saunders, 1898.

The internal evidence that this treatise on operative surgery is the work of a German, bred in the schools, is strong, and is manifested both in its excellencies and in its faults, and we must own to a distinct doubt whether the *methodus scholasticus* of the German pedagogue is well adapted to the instruction of American medical students. The opening pages of the work are illustrative of this, and it is questionable whether any American medical student of ordinary "gumption" who has the mechanical faculty sufficiently

developed to whittle a stick with a jack-knife will be particularly edified by such stuff as Fig. 17, gravely labeled, "Division with Scissors;" especially when he reads in the accompanying text: "In using the scissors the thumb and the middle finger are introduced into the rings of the handles and the index finger is placed upon the lock (Fig. 17)." A separate paragraph is devoted to conveying the following information:

"The tissues to be divided are caught between the blades of the scissors, division being effected by the movement of the blade held by the thumb against the other, which is grasped firmly."

This author is, however, still more remiss in recommending to students who are to be instructed in good surgical practice many questionable and happily discarded procedures, such as the frequent use of the grooved director (this is sensibly criticised by the editor in a footnote) and the very freely recommended practice of tearing and lacerating the tissues with two pairs of anatomical forceps, under the specious name of "blunt dissection." The same is true of the use of the elastic ligature, a barbarous and unsurgical device happily obsolete.

Not only sins of commission make the work an undesirable one from which to have the student form his ideas of surgical practice, but extraordinary omissions mark the book as not up to the times. In the enumeration of suture materials no mention is made of silkworm gut, and the directions for suture of the intestines are so meagre as to be totally inadequate. On page 87 there purports to be a description of the use of Esmarch's elastic bandage, whereas all that is described is the india rubber tourniquet.

Throughout the chapters on amputations and enucleations the "oval" and the "racket" incision are entirely confounded, and the object and occasion for the use of the latter, *i. e.*, to uncover a joint so as to facilitate disarticulation *without sacrifice of tissue*, is certainly not inculcated upon the reader, and apparently is not appreciated by the author. See more particularly page 108.

The lavish use of full page cuts for trivial illustrations, as, for instance, Figs. 12-13-81 and 82 to illustrate the use of the tenotome, and Figs. 205-206 and 207 to illustrate the use of the trochar, seems very unfortunate if it was the occasion of crowding out some simple illustrations of such instruments as the urethrotome and Bigelow's instruments for litholapaxy, without which the text descriptive of the urethral and vesical operations is hardly comprehensible to the neophyte.

A book published in 1898 might reasonably be expected to take notice of the two most important recent advances in the technique of hip-joint amputations, to wit, the transfixion of the thigh with pins to retain the tourniquet, and the elegant device of Dr. McBurney of digital compression of the iliac artery through a "gridiron" incision of the abdominal wall.

The use of the grooved director in tracheotomy is simply bad surgery (p. 279), and the advice given in describing this operation (p. 282), that all bleeding vessels must be closed by ligature before the trachea is opened—is very poor advice without proper qualifications. Whoever has done an emergency operation of this kind on a cyanosed and suffocating patient, knows that the best hæmostatic to arrest even copious venous hemorrhage (and other sources of bleeding hardly come into question) is the admission of oxygen to the lungs. When air has been admitted to the trachea very few vessels need ligation, before that, a dozen ligatures may often not suffice to staunch the blood, and what may not the time required to tie a dozen ligatures mean in a case of asphyxiation?

It would be but charitable to suppose that the author's experience in intubation of the larynx in children was small, when he makes such poor use of two helpers as is directed on page 285; the nurse is to hold the child's head with her right hand, and with her left its hands, while the assistant is charged with the onerous duty of holding the mouth open with the gag. If he thinks that, to quote his words, "in most cases of intubation the mouth-gag can be dispensed with," it is enough to say that such was not the opinion of O'Dwyer.

A brief footnote of the editor's, and that too without description of the *modus operandi*, is the only hint we have of a modern radical operation for cancer of the breast.

It is a sad pity that such an elaborate colored plate as No. 20, illustrating the use of the Murphy button, should be totally wrong in its drawing. Had the author troubled himself to study more accurately Murphy's text and simple wood cuts, he would not have had to incorporate this lame suggestion in the text (p. 317). "In approximating the parts of the button the prolapse of small portions of the mucous membrane in the interval between the segments is to be avoided. Such portions of intestine may require approximation by means of Lambert's seroserous sutures." This condition of pouting of the mucous membrane is sure to follow the application of the purse-string suture in the *improper* way illustrated in Pl. 20, Fig. 1, d. Murphy's method of introducing the suture was expressly devised to obviate this very difficulty. The needle is indicated in the plate before us, as having pierced the wall of the gut alternately from serous surface to mucous surface and then from mucous surface to serous. Reference to Murphy's wood cuts and description will show that the needle should pierce the wall of the gut constantly from without inwards or vice versa, thus whipping the free edge of the intestinal incision and preventing the pouting of mucous membrane. This same Fig. 1 at *a* exhibits a totally wrong, indeed wholly impossible application of the gut to the female half of the button. The gut, as is self-evident, should extend over the collar of the button and hug the central cylinder, so that the serous surface on the female half, and that on the male half of the button, may be pressed together and cause an atrophy of the compressed portion which will allow the button as a whole to pass along by peristalsis in the lumen of the intestines. And this from a man who devotes a paragraph and a half, and a half-page illustration to teach the student how to close a pair of scissors! Plate 20 must have cost the publishers a deal of money, but of a truth "fine feathers do not make fine birds."

It may be historically interesting to know that operations on the abdominal viscera used to be done in two stages, but why teach antiquated surgery in a student's compend?

Nor is the translator perfectly happy in his choice of terms. Fig. 195, representing a Thompson's searcher, is described as a "*massive*" "*stone-sound*" "for exploration of the bladder," much as if it were some interesting relic of the paleolithic age.

It would be well to administer to the unfortunate who had to wear the apparatus depicted on page 335 a powerful anaphrodisiac to avoid unpleasant consequences either to the penile organ or to the fixation apparatus for the retention-catheter, unless this last could itself be depended upon as an efficient *remedium amoris*. Its dreadful appearance is, perhaps, sufficient to this end. How far modern appliances may have reached the clinics of the University of Vienna I have no means of knowing, but most surgeons would prefer laying out the sum of half a dollar to procure for their patients a Holt's retention-

catheter rather than to apply to a sensitive organ the adhesive plaster abomination illustrated in the text. Methods more suitable for use in emergency cases the author might have found in Le Fort's work which he quotes in another connection.

The author's itch to describe antiquated and unsurgical procedures abides with him to the last page of the book, where we are dismissed with a description of the beastly elastic ligature as applied to hæmorrhoids.

It is impossible that a book describing several scores of operations should not describe some good ones. Among them are Malgaigne's subastragaloid enucleation of the foot, and, though we miss the familiar operation of Stephen Smith for amputation at the knee-joint, we have descriptions of the valuable procedures of Gritti and of Ssabanajiff. Furthermore, Esmarch's simple and elegant method of amputating in the hip and in the shoulder-joint are described and illustrated, and so is Miculicz's resection of the foot. Bergmann's radical operation for the cure of hydrocele we are glad to see.

The book, as has been hinted, is very lavishly illustrated, and some of the illustrations are very good. On the whole, however, this is not a book to be recommended to students, for the reason that its teachings are not sound and in keeping with the established principles of modern surgical procedure. The older surgeon may find in it some individual things of value, and by a glance at some of the many plates and wood cuts, may refresh his memory as to some operation he may intend to perform, but it is not right to ask a man to study, as a reliable modern text-book, a volume from which can be culled so much rubbish, or worse than rubbish, as we have indicated in part in this brief review.

A suspicion of the origin of some of these serious faults is raised when we read (on page 269) the description of an operation devised by *E. Zuckerkandl* for the extra-buccal exposure of the buccinator nerve, and compare this name with that of *Dr. Otto Zuckerkandl, Privat-docent at the University of Vienna*, which ornaments the title page, bearing at the same time in mind the assurance in the editor's prefatory note that "*Dr. Zuckerkandl requires no introduction to English-speaking readers.*" Can it be that a modern Phaethon is seeking to drive the chariot of the Sun?

Dr. E. Zuckerkandl is known to English-speaking readers as the author of several treatises on the anatomy and pathology of the nose and throat, and as a laryngologist of some distinction. Has Dr. Da Costa mixed the two names? We fear that Dr. Otto Zuckerkandl's introduction to English-speaking readers, if represented in the volume before us, has been an unfortunate one. *Melius est petere fontes quam sectari rivulos.*

L. W. B., JR.

BOOK NOTICES.

Materia Medica for Nurses. By Emily A. M. Stoney, Graduate of the Training School for Nurses, Lawrence, Mass. W. B. Saunders, 925 Walnut Street, Philadelphia, publisher. Price \$1.50 net.

Saunders' Medical Hand Atlases. Atlas of the External Diseases of the Eye, Including a Brief Treatise on the Pathology and Treatment. By Professor Dr. O. Haab, of Zurich. Edited by G. E. De Schweinitz, A.M., M.D., Professor of Ophthalmology in the Jefferson Medical College, Philadelphia; Consulting Ophthalmologist to the Philadelphia Polyclinic; Ophthalmic Surgeon to the Philadelphia Hospital and to the Orthopedic Hospital and Infirmary for Nervous Diseases. Price \$3.00. Published by W. B. Saunders, Philadelphia.

An Epitome of the History of Medicine. By Roswell Park, A.M., M.D., Professor of Surgery in the Medical Department of the University of Buffalo, etc. Based upon a course of lectures delivered in the University of Buffalo. Second edition. Illustrated with portraits and other engravings. 6½ x 9½ inches. Pages xiv-370. Extra cloth, \$2.00 net. The F. A. Davis Co., publishers, 1914-16 Cherry street, Philadelphia.

Text-Book of Ophthalmology. By Dr. Ernest Fuchs, Professor of Ophthalmology in the University of Vienna. Authorized translation. Revised from the seventh enlarged and improved German edition. By A. Duane, M.D. Second American edition. Published by D. Appleton & Co. Price \$5.00, cloth.

Twentieth Century Practice. An International Encyclopedia of Modern Medical Science. By Leading Authorities of Europe and America. Edited by Thomas L. Stedman, M.D., New York City. In twenty volumes. Volume XVI, "Infectious Diseases." New York: William Wood & Co., 1899.

Electro-Haemostasis in Operative Surgery. By Alexander J. C. Skene, M.D., LL.D. Published by D. Appleton & Co.

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